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WILLIAM T FUJIOKA
Chief Executive Officer

October 15, 2007

To: Supervisor Zev Yaroslavsky, Chairman
Supervisor Gloria Molina
Supervisor Yvonne B. Burke
Supervisor Don Knabe
Supervisor Michael D. Antonovich

From: William T Fujioka
Chief Executive Officer

Dave Lambertson
Director of Internal Services

Bruce W. McClendon, FAICP
Director of Planning

Donald L. Wolfe
Director of Public Works

REPORT ON THE IMPACT OF THE STATE ACTION AGAINST SAN BERNARDINO COUNTY REGARDING ITS GENERAL PLAN UPDATE AND THE COUNTY'S EFFORTS TO IMPROVE ENERGY EFFICIENCY AND COMBAT GLOBAL WARMING (AGENDA OF AUGUST 28, 2007, ITEM NO. 17-A)

On August 28, 2007, your Board adopted the sixth in a series of motions intended to ensure that the County of Los Angeles (the County) is aware of and taking the necessary steps to address issues related to greenhouse gas emissions, global warming, and environmental protection. The motions include a study of Leadership in Energy and Environmental Design (LEED) and Low Impact Development (LID) Standards (1-16-07); a study on proposed incentives for employee purchased hybrids and increased public transit use (3-13-07); an investigation into banning plastic bags (4-10-07); a study on the impacts of banning Styrofoam (5-22-07); and the incorporation of energy efficiency as a criteria for prioritizing deferred maintenance (6-18-07).

The August 28th motion by Supervisor Antonovich, as amended by Supervisor Yaroslavsky, was in response to the recent settlement between the California Attorney General and San Bernardino County (San Bernardino) regarding San Bernardino's General Plan update. Specifically, the Attorney General alleged that the General Plan update failed to address impacts related to greenhouse gas emissions and global warming in contravention of the California Global Warming Solutions Act of 2006 (AB 32). The Attorney General and San Bernardino entered into a settlement in which San Bernardino agreed to take a number of steps to address global warming related issues in an amendment to its recently adopted General Plan.

Specifically, the August 28, 2007 (Attachment A) motion requested that the Chief Executive Officer (CEO), in consultation with County Counsel and the Department of Regional Planning (Regional Planning), to assess the impact of the San Bernardino settlement on Los Angeles County. Your Board also requested that the Departments of Regional Planning, Public Works (Public Works), and Internal Services (ISD) work with the CEO and County Counsel to provide a comprehensive update on the County's efforts to improve energy efficiency, combat global warming, and consider global warming related issues in the County's General Plan update.

As your Board is aware, the Attorney General has been taking steps, including sending a number of comment letters and filing the lawsuit against San Bernardino, to ensure that local jurisdictions adequately consider greenhouse gas emissions and global warming related issues in connection with general plan updates, as well as in connection with other land use activities such as the adoption of specific plans or the approval of large-scale individual projects. The San Bernardino settlement was an initial step in establishing some guidelines and parameters regarding the steps that the Attorney General believes cities and counties should be taking to address greenhouse gas emissions and global warming. Although the San Bernardino settlement is specifically in response to that County's efforts to update its General Plan, it nevertheless provides guidance regarding what the Attorney General may expect Los Angeles County and other local governments to do in connection with their general plan updates and land use decisions.

In order to assess the impacts of the San Bernardino settlement, it is important first to summarize the key provisions of the settlement. In the settlement, San Bernardino agreed to amend its General Plan within a specified time to add a policy outlining San Bernardino's goal of reducing greenhouse gas emissions reasonably attributable to San Bernardino's discretionary land use decisions and internal government operations. San Bernardino also agreed to adopt a Greenhouse Gas Emissions Reduction Plan, which would include a current inventory of emissions and sources, a projected

inventory, a reduction target, and measures to reach that target. San Bernardino further agreed to adopt feasible mitigation measures to control diesel engine exhaust emissions on projects and facilities under the County's discretionary land use jurisdiction.

As noted, the settlement provides some guidance regarding the steps that the Attorney General will expect cities and counties to take in their land use planning efforts to address global warming issues and achieve greenhouse gas emissions reductions in keeping with the provisions of AB 32. San Bernardino did not include any such analysis in its General Plan update prior to the Attorney General's lawsuit. Los Angeles County, however, was already in the process of analyzing these issues in the General Plan update and developing policies to improve energy efficiency, reduce greenhouse gas emissions, and combat global warming prior to the settlement. Since the settlement, Regional Planning has further refined these efforts and developed a comprehensive approach by combining global warming related goals and policies throughout the Draft General Plan and arranging them into an Air Resources and Global Warming section which will become part of the draft General Plan Conservation and Open Space Element. This Air Resources and Global Warming section is included as Attachment B.

The County of Los Angeles is an innovative leader in the fight against global warming. The County General Plan serves as a leading policy document for all of the departments in the County, and the Air Resources and Global Warming section will provide a detailed overview of the County's current and proposed actions to address air quality, energy efficiency, and global warming. The development of the Air Resources and Global Warming section of the draft General Plan is guided by several important policy considerations, including taking steps to ensure that the County complies with the provisions of AB 32 and provides a satisfactory analysis of greenhouse gas emissions and global warming issues in light of the San Bernardino settlement.

The draft Air Resources and Global Warming section summarizes the existing conditions in the County related to air quality issues and global warming, and organizes in one place the many goals and policies in the General Plan that will directly improve air quality in the County, as well as lists the many programs the County has currently implemented and has proposed for implementation to combat global warming, improve energy efficiency, and improve environmental conditions countywide.

While many of the policies and programs in the General Plan update are designed to ensure that the County meets its legal requirements, particularly in light of the San Bernardino settlement, the policies and programs are further designed to ensure the protection of the environmental health and safety of the residents of the County. In developing the policies and programs, Regional Planning conducted public meetings

and outreach, which identified the region's continuing poor air quality ratings as a primary environmental concern for County residents. Regional Planning also took into consideration the increased awareness of land use and circulation policy and its effects on the environment, recognizing that a best practice policy the County can utilize to improve air quality is to organize its land uses and development patterns in ways that reduce our dependence on automobile use.

The two sources that organize and contain the majority of policy information and implementation measures to increase energy efficiency, improve air quality, and address global warming can be found in the Draft Los Angeles County General Plan and the County Code.

- The General Plan: The guiding theme of the County's 2007 General Plan update is to accommodate growth by promoting "green" development and smart growth planning principles that reduce and shorten vehicle trips and vehicle miles traveled, conserve energy and water, protect natural resources, and create great places to live and work. The General Plan provides the framework for how the County will grow and develop over the next 20 years, and it positions Los Angeles County to be an innovative leader in "green" development and environmental stewardship. At the end of the General Plan's Air Resources and Global Warming section within the Conservation and Open Space Element all of the goals and polices related to improving air quality, combating global warming, and improving the conditions of the County's environment will be listed.

- County Code: There are several building and development standards in place within the County Code that address air quality, energy efficiency, and environmental conservation. The Code has several land use management strategies, such as transit-oriented development and clustered development that implement efficient land use policy that reduces environmental impacts and automobile use. Other standards that include open space requirements in new developments, the hillside management ordinance, minimum requirements for parking lot landscaping, and required tree canopies for new development. Further adaptations in the County Code to improve energy efficiency and lessen environmental impacts will be ongoing.

The programs and implementation measures outlined in the General Plan and implemented through the County Code and other endeavors are divided into four programs, which are detailed below:

1. Energy and Water Efficiency Program
2. Green Building/LIDS Program
3. Environmental Stewardship Program
4. Public Education and Outreach Program

Energy and Water Efficiency Program

This program seeks to further reduce County facilities' energy and water consumption through the establishment of specific reduction targets. This program is discussed in the ISD's *Report in Support of the October 23, 2007 Presentation to the Board of Supervisors on Efforts to Improve Energy Efficiency and Combat Global Warming*, prepared as directed by your Board and included as Attachment C. Initiatives contained under the Energy and Water Efficiency Program include:

- ISD Energy Management Program: Ongoing ISD projects that have been implemented have resulted in over $100 million in cumulative energy savings to the County. Most of these savings have been achieved through the retrofitting or replacement of building lighting systems and air conditioning equipment. On annual basis, these savings currently offset approximately 10% of the total ISD Utilities Budget, or the equivalency of 1,370 million pounds of CO_2 prevented from entering into the atmosphere, 12,000 cars taken off the road, or 20,000 acres of trees planted.

- ISD Facility Retro-commissioning Program: Initiated in 2004, this program "tunes up" County heating, ventilation and air conditioning equipment. There are approximately 500 County buildings that are identified for the program and that will receive retrofitting upgrades. Other energy technologies that ISD is investigating to implement in this program where appropriate include: thermal storage, distributed generation, and widespread implementation of ISD's online, real-time energy monitoring tool (EEMIS).

- County Purchasing Policy (P-1050): Under P-1050, ISD's Purchasing Division will determine appropriate standards for green purchasing and will develop a 5-year plan to phase-in categories of certified goods. Easy to adopt purchasing categories, such as paper and cleaning supplies, will be implemented immediately. Central purchasing agreements with a catalog of environmentally friendly and energy efficient products will be established.

- Integrated Regional Water Management Plans (IRWMP): There are currently three IRWMPs in the planning process within Los Angeles County: Antelope Valley, Upper Santa Clara, and Greater Los Angeles County Region. These plans develop

strategies to secure a safe and reliable supply of water for the County. Within the plans are various project lists, of which many apply directly to the reduction of Greenhouse gases. Global warming is projected to worsen the intensity of droughts and increase drought occurrence. The implementation of these plans will address water efficiency, conservation, and recycling, as well as the protection of ground and surface water and the development of new supplies.

- Recycled Water Task Force: In 2006, the Board directed Public Works to convene a Task Force to make recommendations for the expanded use of recycled water for nonpotable purposes in the County. The County recognizes that increasing the use of recycled water would significantly lessen the County's dependency and the environmental impacts of imported water sources.

Green Building Program

On January 16, 2007, the Board directed the creation of a green building program that would incorporate green building standards into all appropriate industrial, commercial, and residential development projects. The Board also directed the creation of a sustainable design program for County operations that includes practices to achieve LEED Silver Certification for new buildings greater than 10,000 square feet. In response to that motion, Regional Planning, ISD, and Public Works have taken a number of steps to develop green building initiatives to establish and implement the Green Building Program. These initiatives include:

- Energy and Environmental Policy Team: The Energy and Environmental Policy team is comprised of officials from Regional Planning, ISD, and Public Works, and works toward implementing the Green Building Program and Low Impact Development (LID) Standards outlined in the report below.

- Green Building Program and Low Impact Development (LID) Standards for the Unincorporated Areas of Los Angeles County (Report): This initiative provides guidance to incorporate two major "green" programs in the County:

  - Green Building: Regional Planning prepared a report entitled *Green Building Standards for the Unincorporated Areas of Los Angeles County*, which provides guidance on the implementation of LEED standards or similar requirements in the County's development standards for all appropriate industrial, commercial, and residential development. The report, which is included as Attachment D, includes recommend changes to building and zoning codes and establishes baseline standards for energy efficiency.

- Low Impact Development (LID): Public Works prepared a related report entitled *Low Impact Development Standards for the Unincorporated Areas of Los Angeles County*, which provides guidance on the implementation of LID practices in standards for new development and redevelopment projects in the County. The report, which is included as Attachment E, includes recommended changes to building and zoning codes and establishes standards for LID compliance.

- The Green Grant Program: Provides money to upgrade homes with energy saving tools, such as tankless water heaters, solar panels, insulation, and attic fans. The program is targeted to low-income homeowners in unincorporated County areas and is funded by Community Development Block Grants (CDBG).

Environmental Stewardship Program

The program's purpose is to reduce the County's "environmental footprint" including the amount of greenhouse gases produced through direct and indirect County operations. Initiatives contained under the Environmental Stewardship Program include:

- California Climate Action Registry: The County has joined the Registry in order to utilize their reporting protocol for developing an assessment of the County's total greenhouse gases emissions responsibility.

- County "Clean Fuels" Policy: Since 1995, the Board has directed all County departments to report on the composition of their fleet and their progress toward acquiring clean fuel vehicles.

- Departmental Recycling: The Energy and Environmental Policy Team is working to enhance the County Departmental recycling Program which is led by the Public Works' Environmental Programs Division. This program placed a priority on implementing recycling bins in visible areas for the segregation of paper, plastic, glass and other recyclables from normal waste.

- Policies for Livable, Active Communities and Environments (PLACE) Program: The Department of Public Health's PLACE program addresses the influences of land use and community design on physical health. This program is open to cities, nonprofits, school and for profit organizations that seek to promote changes to the built environment, such as streets, parks, and alternate modes of transportation, that promote physical activity in the everyday lives of County residents.

Public Education and Outreach Program

This program utilizes the County's communication and outreach channels to facilitate energy conservation practices and assistance programs. Initiatives contained under the Environmental Stewardship Program include:

- Rideshare: The County of Los Angeles Air Quality-Rideshare Program, mandated by County Ordinance 90-0033U, complies with the South Coast Air Quality Management District (SCAQMD) Rule 2202 Employee Commute Program and the federal Clean Air Act. Its mission is to promote ridesharing and telework as a workplace strategy that reduces traffic congestion, air pollution and commuter costs. The Chief Executive Office sets program policy and coordinates implementation of uniform procedures, through a Countywide Coordinator Network. The County Labor-Management Advisory Committee has oversight responsibility for Civic Center Rideshare strategies and achievement of regional air quality/rideshare goals.

- Environmental Fairs: Coordinated by the Energy and Environmental Policy Team, there will be a series of energy and environmental fairs which will provide County employees and the public with opportunities to learn about energy efficient and sustainable products and practices for home and work.

- Regional Outreach: The Energy and Environmental Policy Team conducts workshops on doing "green" business with the County. The first workshop was held in March 2007 in El Segundo with the Office of Small Business.

- Local Government Collaboration: The County, through ISD, has joined the Local Government Commission's Local Government Sustainable Energy Coalition (LGSEC). The LGSEC is an association of local governments who have committed to tracking and participating in energy activities jointly in order to conserve expenses and speak with a stronger, unified voice.

It will truly be a countywide effort to combat the serious impacts of our growth on the environment and on climate change. The Department of Regional Planning has been a leader in coordinating a collaborative outreach effort to incorporate all County departments in the effort to address the requirements of AB 32, and also to improve the environmental practices and procedures of our land use development and building practices.

AB 32 requires significant attention to the creation of land use and building practices that will have far reaching effects on air quality, energy consumption, and global warming. Because of the multi-faceted implementation of the programs and practices

countywide, as well as the fact that such implementation will require the combined effort of many different County departments, it is important that the County's efforts to combat global warming be appropriately coordinated to fulfill the AB 32 state mandates and the County's goals. With the full support of the Board of Supervisors, the CEO, Public Works and ISD, Regional Planning is assuming this coordinating responsibility.

If you have any questions, please contact me or Paul McCarthy by phone at (213) 974-6461 or by email at pmccarthy@planning.lacounty.gov.

WTF:DL:BWM
DLW:LS:PM:os

Attachments (5)

c: Executive Officer, Board of Supervisors
County Counsel

ATTACHMENT A

August 28, 2007 Board of Supervisors motion to assess the impact of the San Bernardino settlement on Los Angeles County

MINUTES OF THE BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

Sachi A. Hamai, Executive Officer-
Clerk of the Board of Supervisors
383 Kenneth Hahn Hall of Administration
Los Angeles, California 90012

At its meeting held August 28, 2007, the Board took the following action:

17-A

Supervisor Antonovich made the following statement:

> "Several months ago the State of California Attorney General sued the County of San Bernardino concerning County adoption of an update to its General Plan. The litigation, which claimed that the Plan failed to address how the County's land use plan addressed impacts upon global warming, was recently settled. The County agreed to amend its General Plan to measure its impact on greenhouse gases and to take positive steps to reduce those impacts."

Therefore, Supervisor Antonovich made a motion that the Chief Executive Officer be directed, in consultation with County Counsel and the Director of Planning, to determine if and how the decision in the recently settled lawsuit filed by the State Attorney General against the County of San Bernardino, for failure to address the impact of greenhouse gases on global warming in their updated General Plan on land use, applies to Los Angeles County.

Supervisor Yaroslavsky made the following statement:

> "While the Attorney General has settled his lawsuit regarding San Bernardino County's General Plan, legal challenges by private parties who are concerned about that Plan's failure to adequately address global warming still remain active. Further, beyond the growing legal mandate to address this issue, the problem of global warming is closely related to this country's continued reliance on fossil fuels and our region's chronic air quality problems. To address these environmental threats, this Board has already set a mandate to reduce the County's energy use 20% by 2015, required new County buildings over 10,000 square feet to meet LEED-Silver standards or better, and directed the Departments of Regional Planning and Public Works to develop standards that will improve energy and water efficiency in private developments within the County's jurisdiction. It is important that the Board of Supervisors continue to ensure that the County moves forward on these initiatives."

(Continued on Page 2)

Therefore, Supervisor Yaroslavsky made a suggestion that Supervisor Antonovich's motion be amended to further direct the Directors of Planning, Public Works, and Internal Services to join the Chief Executive Officer and County Counsel in providing a comprehensive update to the Board of Supervisors at its meeting of October 23, 2007 regarding the efforts to improve energy efficiency and combat global warming, as well as the County's efforts to consider global warming as part of its General Plan update. Supervisor Antonovich accepted Supervisor Yaroslavsky's amendment.

Supervisor Antonovich's motion, as amended, seconded by Supervisor Yaroslavsky, was unanimously carried (Supervisor Molina being absent).

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Copies distributed:
Each Supervisor
Chief Executive Officer
County Counsel
Director of Planning
Director of Public Works
Director of Internal Services

ATTACHMENT B

Los Angeles County Draft General Plan,
Air Resources and Global Warming section of
the Conservation and Open Space Element

VI. AIR RESOURCES and GLOBAL WARMING

Southern California residents consistently rank the region's poor air quality as one of their highest concerns. Despite a wide array of stringent regulatory efforts that have produced some gains in cleaning the air over the last few decades, the South Coast Air Basin (SCAB), which includes the majority of Los Angeles County, continues to have some of the worst air quality ratings in the nation.[16] Additionally, climate change, caused by global warming gases, is now among the most concerning environmental issues and demands immediate attention by County officials.

The County recognizes that good air quality is a vital component of a high quality of life for County residents and businesses, and that global warming poses a serious threat to our environment, our economy, and our biological and ecological habitats. This section of the General Plan summarizes the existing conditions related to air quality issues and global warming, and organizes in one place the many goals and policies in the General Plan that will directly improve air quality in the County.

Background

Regulated Air Pollutants

The air pollutants that are regulated by the Federal and California Clean Air Acts fall under three categories, each of which are monitored and regulated differently:

- Criteria air pollutants,
- Toxic air contaminants (TACs), and
- Global warming and ozone-depleting gases.

1. Criteria Pollutants: In 1970, the U.S. Environmental Protection Agency (EPA) identified six "criteria" pollutants they found to be the most harmful to human health and welfare. They are:
    - Ozone;
    - Particulate Matter (PM);
    - Carbon Monoxide (CO);
    - Nitrogen Dioxide (NO_2);
    - Sulfur Dioxide (SO_2); and
    - Lead. (Pb)

There are established federal and state air quality standards to protect public health from criteria pollutants. Among the federally identified criteria pollutants, the County levels of ozone, particulate matter and carbon monoxide continually exceed federal and state health standards. Table xx in the Technical Appendix

[16] Southern California Association of Governments, *The State of the Region 2006.*

displays the National and California Ambient Air Quality Standards. Table xx is a summary of the primary sources and effects of the federally identified criteria pollutants.

Table xx. Primary Sources and Effects of Criteria Pollutants

Pollutants	Source	LA County Classification	Primary Health Effects
Ozone (O3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight ("smog")	Extreme non-attainment area	Aggravation of respiratory and cardiovascular diseases; Reduced lung function; Increased cough and chest discomfort
Fine Particulate Matter (PM10 and PM 2.5)	Stationary combustion of fuels; construction activities; industrial processes, atmospheric chemical reactions	Serious non-attainment area	Reduced lung function; Aggravation of respiratory and cardio-respiratory diseases; Increased mortality rate; Reduced lung function growth in children.
Carbon Monoxide (CO)	Incomplete combustion of fuels, such as motor vehicle exhaust	Serious non-attainment area	Aggravation of some heart disease.
Nitrogen Dioxide (NO2)	Motor vehicle exhaust; high-temperature stationary combustion; atmospheric reactions	*Concentrations have not exceeded national standards since 1991, but emissions remain a concern because of their contribution to O3 and PM	Aggravation of respiratory illness.
Sulfur Dioxide (SO2)	Combustion of sulfur containing fossil fuels; smelting of sulfur-bearing metal ores; industrial processes	Attainment area	Aggravation of respiratory diseases (asthma, emphysema); Reduced lung function.
Lead (Pb)	Contaminated soil	Attainment area	Behavioral and hearing disabilities in children; Nervous system impairment.

Source: South Coast Air Quality Management District, 2005.

2. Toxic Air Contaminants (TACs): There are hundreds of TACs, such as formaldehyde and methanol, which do not currently have federal or state ambient air quality standards. However, exposure to TACs is associated with elevated risk of cancer, birth defects, genetic damage, and other adverse health effects.

   TACs are regulated through technology-based requirements that are implemented by state and local agencies. In California, TACs are regulated through the Air Toxics Program and the Air Toxics "Hot Spots" Information and Assessment Act. In the Los Angeles County region, operators of specific facilities must submit comprehensive emission inventories, which are in turn used to further categorize each facility as high-, intermediate-, and low-priority based on the potency, toxicity, quantity, and volume of their emissions. If the risks are above specific levels, facilities are required to notify surrounding populations and to develop and implement a risk reduction plan.

3. Global Warming and Ozone-Depleting Gases:
   - Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. This layer of gases prevents the escape of heat, similar to the function of a greenhouse. Gases that are identified as contributing to the "greenhouse" effect and are responsible for global warming are regulated through California's AB 32, which is covered in detail below.
   - Ozone-depleting gases contribute to the destruction of the Earth's naturally occurring ozone, which protects our planet from the damaging effects of solar ultraviolet radiation. The biggest contributors to ozone depletion are chlorofluorocarbons CFCs), halons, carbon tetrachloride, methyl chloroform, and other halogenated compounds.

The negative effects of poor air quality have economic and social outcomes in addition to physical side effects, such as the economic impacts associated with increased absences from work and school, damage to agricultural activities, and the depletion of our scenic resources and natural environments. Effective regulation of air pollution, through innovative land use strategies and collaboration with air quality agencies is a primary goal of the County's General Plan.

Air Quality Regulatory Agencies

The Federal Clean Air Act (CAA) of 1977 was a major policy milestone for the current federal and state systems that regulate air pollution. The following discussion summarizes the air quality agencies that play a role in regulating air pollution in Los Angeles County.

U.S. Environmental Protection Agency (US-EPA)

The US-EPA establishes national ambient air quality standards, enforces the federal Clean Air Act, and regulates emission sources under the exclusive authority of the federal government. These sources include aircraft, certain ships and locomotives. Information on the programs and activities in US-EPA IX, which includes California, can be found at www.epa.gov/region9.

California Air Resources Board (CARB)

CARB was created as part of the California Environmental Protection Agency in 1991. CARB is responsible for the implementation of the California Clean Air Act, establishing state ambient air quality standards, and for overseeing several programs related to emission reduction activities. More information on CARB programs and activities can be found at www.arb.ca.gov.

South Coast Air Quality Management District (SCAQMD)

Created in response to the region's poor air quality, the SCAQMD is responsible for monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the region. The SCAQMD implements a wide range of programs and regulations that address point source pollution and mobile source emissions, and enforces air quality through inspections, fines, and educational training.

The SCAQMD jurisdiction is approximately 10,743 miles and includes all of Los Angeles County except for the Antelope Valley, which is covered by the Antelope Valley Air Quality Management District (AVAQMD). Until 1997 the SCAQMD was responsible for air pollution control in all of Los Angeles County. However, in 1997 a special Antelope Valley district was created under the SCAQMD with greater local autonomy for air pollution control. By 2002 this district changed its designation to the Antelope Valley Air Quality Management District (AVAQMD).

The SCAQMD jurisdiction is divided into sub-regions, or basins. The majority of Los Angeles County is in the South Coast Air Basin (SCAB), while the area north of the San Gabriel Mountains is in the Mojave Desert Air Basin (MDAB) (Figure xx). The SCAQMD and the AVAQMD are the regulatory agencies in the two County air basins that are tasked with creating regulations, programs and policies to reduce air pollution in Los Angeles County.

Governed by twelve Board members, one of which is a member of the Los Angeles County Board of Supervisors (BOS), SCAQMD adopts policies and regulations that promote clean air. A member of the BOS is also on the AVAQMD seven-member Governing Board. The separation of the two districts reflects the geographic, climatological and population differences of the highly urbanized Los Angeles basin and the less urbanized high desert of northeastern Los Angeles County.

Global Warming

There is wide scientific agreement that human actions and development patterns are contributing to the warming of the Earth's temperatures. The County recognizes the importance of addressing global warming through the goals and policies of its General Plan. The following discussion summarizes the legal setting related to planning for global warming, and is followed by the goals, policies and implementation measures in the General Plan the County employs to address greenhouse gas emissions and climate change.

AB 32: California Global Warming Solutions Act of 2006

AB 32 is a landmark law that aims to control and reduce the emission of global warming gases in California. An overwhelming majority of scientists from around the world have universally predicted that global warming will have a number of adverse impacts on the State's ecosystems and economy. Varying scenarios call for a range of climatic changes that could produce intense flooding or prolonged droughts, higher temperatures that can cause more wildfires, or rising sea levels that will affect low-lying coastal areas.

In California, there are a number of gases, such as methane, nitrous oxide and hydroflourocrabons that are contributing to the greenhouse effect, which refers to both naturally occurring greenhouse gases and gases emitted as a result of human activities. However, the largest greenhouse gas contributor is carbon dioxide, and in California, more than half of the fossil fuel emissions of carbon dioxide are related in some way to transportation uses. As the County has some of the highest rates of single-occupant automobile use, traffic congestion and Vehicle Miles Travelled (VMT) in the nation, the County's economy and environment are especially susceptible to the negative impacts of global warming.

AB 32 requires that the California State Air Resources Board (CARB) establish a comprehensive program of regulatory and market mechanisms to reduce greenhouse gases and carbon dioxide emissions to 1990 levels by the year 2020. The County, its cities, and businesses within the County borders will all have to comply with the AB 32 program as developed by CARB.

Planning Issues Related to Air Quality and Global Warming

In anticipation of future regulatory measures, the General Plan implements many policies related to greenhouse gas emissions and global warming, as seen in the goals and policies section below. In addition, the County has already initiated several programs specifically designed to reduce greenhouse gas emissions, and has begun the creation of a countywide Greenhouse Gasses Emissions Reduction Plan. As these programs are further developed, the County will continue to participate in providing both regulatory and market strategies to meet the objectives established in the AB 32 law.

The Greenhouse Gas Emissions Reduction Plan

The Los Angeles County Greenhouse Gas Reduction Plan is being drafted in preparation of the County fulfilling the objectives outlined in California State law AB 32, which mandates a reduction of greenhouse gas emissions to 1990 levels by the year 2020. To achieve this mandate, the County is currently working to determine the quantity of its greenhouse gas emissions and identify which sectors are responsible for the majority of greenhouse gas emissions.

A comprehensive list of policies and action programs to conserve resources and abate global warming are being compiled. An important final step, to be determined with the help of State and local officials, will be to calculate the quantifiable savings from our policies and action plans. For now, however, the County, through its General Plan update, will implement a multitude of enforceable policies related to land use, energy conservation and circulation that will work toward reducing the County's greenhouse gas emissions. The following sections outline the general policy coordination of the General Plan elements with issues important to the County's greenhouse gas emission reduction activities.

Land Use Element

The way the County organizes its land use is one of the most significant actions it can take to improve the region's air quality and to reduce greenhouse gas emissions. The Los Angeles County General Plan stresses the value of an efficient use of land that provides for a more a healthy, livable, walkable and sustainable community character. Several strategies devoted to this end are the encouragement of mixed-use developments along the County's major transportation routes, the identification of several transit-oriented districts (TODs) that promote housing and services near transportation hubs, and the employment of development patterns that lessen the "footprint" on our natural systems and thus allow for more recreation and environmental conservation.

The General Plan Land Use Element introduces two very important programmatic actions the County is taking to address greenhouse gases and energy conservation. The first is the promotion and implementation of LEED building requirements, and the second is the implementation of Low Impact Development (LID) techniques and practices, both of which are summarized in detail under the listing of current County programs below.

In short, the Land Use Element is the primary tool for the implementation of a more efficient, smart growth-focused land use configuration for the County's unincorporated areas. The ultimate objective of all of our land use policies is to limit the amount of sprawl and negative human impacts that development places on our landscape, our air, and our health. The goals and policies of the General Plan provide an enforceable set of policy direction to achieve these objectives.

Circulation Element

There is a direct link between the County's circulation activities and air pollution. Mobile sources of pollution, such as cars, trucks, buses, construction equipment, trains, ships and airplanes, account for 60 percent of all smog producing emissions in the region.[17] Additionally, the County's highly congested freeways and highways further contribute to the conditions that produce air pollution.

Despite the fact that Los Angeles County has markedly improved its air quality over previous decades, the region still has the nation's poorest air quality. More importantly, the continued population and economic growth that is projected for the County could overwhelm these air quality gains unless careful attention is paid to voluntary and regulatory measures that reduce transportation-related emissions.

The General Plan provides a wide array of policies that address strategies for improving air quality and reducing greenhouse gas emissions in the County. Many strategies are transportation-based, such as improving the efficiency of the County roadway network, and implementing mobility management opportunities such as increased ridesharing and vanpools. Many other policies, however, are based on creative land use strategies that require less automotive travel. These include promoting mixed use and transit-oriented development (TOD), which encourages infill development over suburban sprawl and provides opportunities for increased transit use. Developer incentives to increase density in both existing and newly subdivided areas encourage more pedestrian activity and less reliance on automobiles, particularly if employment opportunities and services are nearby. Finally, the County is promoting new design standards related to streets and sidewalks for the sole purpose of encouraging healthier, more attractive environments for walking and biking, further reducing the need and desire to use the automobile.

Conservation and Open Space

The Conservation and Open Space Element provides policy direction for a multitude of the County's most important natural resources, all of which work toward the goal of preserving our resources, conserving energy, and reducing the human impact on the environment. Many of the goals and polices of the Conservation and Open Space Element recognize the same tenet of the Land Use Element - that they way the County organizes its land is extremely important in fighting air pollution and greenhouse gas emissions.

The General Plan provides specific guidance on the need to preserve the County's remaining open spaces, provide recreational amenities that reduce the need for people to drive, and to provide much-needed green amenities for County residences. This element also details the County's Significant Ecological Areas and Hillside Management programs, which allow the County to preserve its biotic resources and hillsides through land use regulation. Further policy

[17] South Coast Air Quality Management District (SCAQMD) website.

guidance promotes locally grown, sustainable and organic farming practices, and also the increased encouragement of cultivating renewable energy resources, such as wind and solar farms.

The General Plan strives to provide more than just broad policy guidance and as such, many policies and action programs are immediately enforceable and will be easily implemented upon adoption.

Public Services and Facilities

The Public Services and Facilities Element is a collaborative effort with the County agencies and departments that provide the primary services for County residents and businesses. The collaborative effort between County agencies has resulted in the adoption of the Plan's goal for sustainable practices and development by multiple County service providers. As such, the General Plan has a far-reaching effect for promoting practices that will improve our air quality, reduce greenhouse gases, and improve our environment.

Important contributors to the Public Services and Facilities Element include the Department of Public Works and Sanitation Districts, who effectively manage the County's water and sewer infrastructure. The General Plan provides clear policy guidance to reduce the impacts on our water through Low Impact Development (LID) practices and LEED greenbuilding techniques, and also through more effective stormwater and wastewater management. Additionally, the General Plan provides policy direction for the management of the County's significant waste reduction programs and practices.

The General Plan provides a means for a variety of collaborative projects and policies that will be important in the County's abatement of air pollution and reduction in greenhouse gases as required by AB 32. The County is already taking steps to increase water and energy efficiency and reduce its impacts on climate change. The following sections outline the current and proposed programs that the County employs to directly address air pollution and greenhouse gas reduction, followed by the goals and policies from the General Plan that work together with these programs to positively affect climate change.

Current and Proposed County Programs

The two sources that organize and contain the majority of policy information and implementation measures to increase energy efficiency, improve air quality, and address global warming can be found in the Draft Los Angeles County General Plan and the County Code.

- The General Plan: The guiding theme of the County's 2007 General Plan update is to accommodate growth by promoting "green" development and smart growth planning principles that reduce and shorten vehicle trips and vehicle miles traveled, conserve energy and water, protect natural

resources, and create great places to live and work. The General Plan provides the framework for how the County will grow and develop over the next 20 years, and it positions Los Angeles County to be an innovative leader in "green" development and environmental stewardship. The list at the end of this section compiles in one place the General Plan's goals and policies related to improving air quality, combating global warming, and improving the conditions of the County's environment.

- County Code: There are several building and development standards in place within the County Code that address air quality, energy efficiency, and environmental conservation. The Code has several land use management strategies, such as transit-oriented development and clustered development that implement efficient land use policy that reduces environmental impacts and automobile use. Other standards that include open space requirements in new developments, the hillside management ordinance, minimum requirements for parking lot landscaping, and required tree canopies for new development. Further adaptations in the County Code to improve energy efficiency and lessen environmental impacts will be ongoing.

The programs and implementation measures outlined in the General Plan and implemented through the County Code and other endeavors are divided into xx programs, which are detailed below:

1. Energy and Water Efficiency Program
2. Green Building Program
3. Environmental Stewardship Program
4. Public Education and Outreach Program

Energy and Water Efficiency Program

This program seeks to further reduce County facilities energy and water consumption through the establishment of specific reduction targets. Initiatives contained under the Green Building Program include:

- Internal Services Department (ISD's) Energy Management Program: Ongoing ISD projects that have been implemented have resulted in over $100 million in cumulative energy savings to the County. Most of these savings have been achieved through the retrofitting or replacement of building lighting systems and air conditioning equipment. On annual basis, these savings currently offset approximately 10% of the total ISD Utilities Budget, or the equivalency of 1,370 million pounds of CO_2, 12,000 cares taken off the road, or 20,000 acres of trees planted.

- ISD Facility Retrofitting Program: Initiated in 2004, this program "tunes up" County heating, ventilation and air conditioning equipment. There are approximately 500 County buildings that are identified for the program and

that will receive retrofitting upgrades. Other energy technologies that ISD is investigating to implement in this program where appropriate include: thermal storage, distributed generation, and widespread implementation of ISD's online, real-time energy monitoring tool (EEMIS).

- County Purchasing Policy (P-1050): Under P-1050, ISD's Purchasing Division will determine appropriate standards for green purchasing and will develop a 5-year plan to phase-in categories of certified goods. Easy to adopt purchasing categories, such as paper and cleaning supplies, will be implemented immediately. Central purchasing agreements with a catalog of environmentally friendly and energy efficient products will be established.

- Integrated Regional Water Management Plans (IRWMP): There are currently three IRWMPs in the planning process (Antelope Valley, Upper Santa Clara, and Greater Los Angeles County Region) within Los Angeles County. These IRWMP plans are charged with developing strategies to secure a safe and reliable supply of water for the County. Within the plans are various project lists, of which many apply directly to the reduction of Greenhouse gases. Global warming is projected to worsen the intensity of droughts and increase drought occurrence. The implementation of these plans will address water efficiency, conservation, and recycling as well as the protection of ground and surface water and the development of new supplies.

- Recycled Water Task Force: In 2006, the BOS directed the Department of Public Works to convene a Task Force to make recommendations for the expanded use of recycled water for non potable purposes in the County. The County recognizes that increasing the use of recycled water would significantly lessen the County's dependency and the environmental impacts of imported water sources.

Green Building Program

In January 0f 2007, the Board directed the creation of a sustainable design program for County operations that includes practices to achieve LEED Silver Certification for new buildings greater than 10,000 square feet. Initiatives contained under the Green Building Program include:

- Energy and Environmental Policy Team: The Energy and Environmental Policy team is comprised of officials from the Department of Regional Planning, ISD, and the Department of Public Works, and works toward implementing the Green Building Program and Low Impact Development (LID) Standards outlined in the report below.

- Green Building Program and Low Impact Development (LID) Standards for the Unincorporated Areas of Los Angeles County (Report): This

report, as directed by the Board of Supervisors in 2007, provides guidance to incorporate two major "green" programs in the County:

- Green Building: Pertains to the implementation of LEED standards or similar requirements in the County's development standards for all appropriate industrial, commercial and residential development. The report will recommend changes to building and zoning codes and will establish baseline standards for energy efficiency.
- Low Impact Development (LID): Pertains to the implementation of LID practices in standards for new development and redevelopment projects in the County. The report will recommend changes to building and zoning codes and will establish standards for LID compliance.

- The Green Grant Program: Provides money to upgrade your home with energy saving tools, such as tankless water heaters, solar panels, and insulation and attic fans. The program is targeted to low-income homeowners in unincorporated County areas and is funded by Community Development Block Grants (CDBG).

Environmental Stewardship Program

The program's purpose is to reduce the County's "environmental footprint" including the amount of greenhouse gases produced through direct and indirect County operations. Initiatives contained under the Environmental Stewardship Program include:

- California Climate Action Registry: The County has joined the Registry in order to utilize their reporting protocol for developing an assessment of the County's total greenhouse gases emissions responsibility.

- County "Clean Fuels" Policy: Since 1995, the Board of Supervisors (BOS) has directed all County departments to report on the composition of their fleet and their progress toward acquiring clean fuel vehicles.

- Departmental Recycling: The Energy and Environmental Policy team is working to enhance the County Departmental recycling Program which his led by the Public Works' Environmental Programs Division. This program placed a priority on implementing recycling bins in visible areas for the segregation of paper, plastic, glass and other recyclables from normal waste.

- Policies for Livable, Active Communities and Environments (PLACE) Program: The Department of Public Health's PLACE program addresses the influences of land use and community design on physical health. This program is open to cities, non-profits, school and for profit organization that seek to promote changes to the built environment, such as streets, parks, and alternate modes of transportation, that promote physical

activity in the everyday lives of County residents.

Public Education and Outreach Program

This program utilizes the County's communication and outreach channels to facilitate energy conservation practices and assistance programs. Initiatives contained under the Environmental Stewardship Program include:

- Rideshare: The County of Los Angeles Air Quality-Rideshare Program, mandated by County Ordinance 90-0033U, complies with the South Coast Air Quality Management District (SCAQMD) Rule 2202 Employee Commute Program and the federal Clean Air Act. Our mission is to promote ridesharing and telework as a workplace strategy that reduces traffic congestion, air pollution and commuter costs. The Chief Executive Office sets program policy and coordinates implementation of uniform procedures, through a Countywide Coordinator Network. The County Labor-Management Advisory Committee has oversight responsibility for Civic Center Rideshare strategies and achievement of regional air quality/rideshare goals.

- Environmental Fairs: Coordinated by the Energy and Environmental Policy Team, there will be a series of energy and environmental fairs which will provide County employees and the public with opportunities to learn about energy efficient and sustainable products and practices for home and work.

- Regional Outreach: The Energy and Environmental Policy team conducts workshops on doing "green" business with the County. The first workshop was held in March 2007 in El Segundo with the Office of Small Business.

- Local government Collaboration: The County, through ISD, has joined to the Local Government Commission Sustainable Energy Coalition (LGSEC). The LGSEC is a membership of local governments who have committed to tracking and participating in energy activities jointly in order to conserve expenses and speak with a stronger, unified voice.

The goals and policies which apply to air resources and global warming are:

Goals and Policies

Goal AR-1 **A County that exceeds State air quality standards.**

Policy AR 1.1 Support efforts to reduce the effects of Global Warming through the participation in AB 32 (2006) programs that reduce greenhouse gas emission in the County.

Policy AR 1.2 Require the use of zero, low emission, biodiesel and hybrid vehicles in the County motor pool.

Land Use

Goal AR-2 **Efficient and progressive land use policies that address the diverse needs of all County residents.**

Policy AR 2.1 Encourage urban infill development on vacant or underutilized sites and brownfield areas.

Policy AR 2.2 Promote and encourage transit oriented development (TOD) along major transportation and transit corridors and in project design.

Policy AR 2.3 Encourage mixed use development to facilitate the linkage between housing and employment throughout the County.

Policy AR 2.4 Promote land use practices that encourage housing to be developed in proximity to employment opportunities.

Policy AR 2.5 Promote land use practices that enhance public health.

Policy AR 2.6 Endorse increased residential density in appropriately designated areas.

Policy AR 2.7 Require development that is energy efficient or Leadership in Energy and Environmental Design (LEED) certified.

Policy AR 2.8 Support land use policy that promotes environmental justice.

Policy AR 2.9 Promote development that adheres to the principles of Low Impact Design (LID).

Policy AR 2.10 Promote sustainable subdivisions that meet Leadership in Energy and Environmental Design – Neighborhood Development standards.

Policy AR 2.11 Discourage “leapfrog’ and sprawl development.

Policy AR 2.12 Expand pedestrian-only streets, plazas and other pedestrian-friendly environments that encourage walking and biking.

Goal AR-3 **Sustainable communities that conserve resources and protect the environment.**

Policy AR 3.1 Promote and require "green building" principles, LEED certification, and Low Impact Development (LID) in all development activities.

Policy AR 3.2 Encourage land use conservation initiatives that minimize the consumption of resources and environmentally sensitive areas.

Policy AR 3.3 Require development that preserves and restores the natural hydrologic system.

Policy AR 3.4 Promote efficient community water and energy practices.

Policy AR 3.5 Preserve and expand green spaces throughout the County.

Policy AR 3.6 Require development to optimize the solar orientation of buildings to maximize passive and active solar design techniques in accordance with the Subdivisions Map Act.

Policy AR 3.7 Require building practices that reduce "heat island" effects, such as light-colored and reflective roofing materials and paint, and shade trees on the south and west sides of buildings.

Policy AR 3.8 Expand incentives for the use of energy efficient hardware and systems, such as for appliances, office equipment, and lighting systems.

Circulation

Goal AR-4 **An accessible circulation system that ensures the mobility of people and goods throughout the County.**

Policy AR 4.1 Expand the availability of transportation options throughout the County.

Policy AR 4.2 Encourage a range of transportation services at both the regional and local levels, especially for transit dependent populations.

Policy AR 4.3 Expand public incentives that encourage the use of public transit.

Goal AR-5 **An efficient circulation system that effectively utilizes and expands multi-modal transportation options.**

Policy AR 5.1 Reduce Vehicle Miles Traveled (VMT) and vehicle trips through the use of alternative modes of transportation and various mobility management practices, such as the reduction of parking requirements, employer/institution based transit passes, regional carpooling programs,

teleconferencing and telecommuting.

Policy AR 5.2 Expand the designation of parking spaces and infrastructure for HOV vehicles, vans used for ridesharing, and other alternative fuel vehicles and electric vehicles.

Goal AR-6 An environmentally sensitive circulation system through the use of innovative programs and technologies.

Policy AR 6.1 Encourage the use of emerging technologies in the development of transportation facilities and infrastructure, such as hydrogen gas stations, Intelligent Transportation Systems (ITS), and electric care plug-in ports.

Policy AR 6.2 Minimize roadway runoff through the use of permeable surface materials wherever possible.

Policy AR 6.3 Require alternative roadway geometries that enhance median/parkway swales, bio-retention and minimize roadways, parking lot surfaces and pollutants conveyed by runoff.

Policy AR 6.4 Expand coordinated traffic light systems to promote more efficient circulation of traffic in congested areas.

Policy AR 6.5 Require the use of Light Emitting Diode (LED) traffic lights.

Goal AR-7 Effective inter-jurisdictional coordination and collaboration in all aspects of transportation planning.

Policy AR 7.1 Support the County Scenic Highway Plan to preserve resources of scenic importance.

Policy AR 7.2 Support the County Bikeway Plan and continue development of a regional coordinated system of bikeways and bikeway facilities.

Policy AR 7.3 Expand public outreach activities related to the use of transit.

<u>Conservation and Open Space</u>

Goal AR-8 Mineral extraction activities that are conducted in a manner that protects the environment.

Policy AR 8.1 Encourage the recycling of abandoned mineral extraction sites to recreational, industrial or other productive use.

Goal AR-9 An optimal mix of renewable and non-renewable energy sources.

Policy AR 9.1 Expand the production and use of alternative energy resources.

Policy AR 9.2 Encourage the effective management of non-renewable resources.

Policy AR 9.3 Require all new development to have solar panels on every structure by 2035.

Goal AR-10 A County that maximizes energy conservation.

Policy AR 10.1 Utilize energy conservation initiatives such as urban heat island reduction techniques, Low Impact Development LID), LEED certification, and consumer education.

Policy AR 10.2 Promote energy efficiency standards for night lighting throughout the County that reduces light trespass and light pollution into the night sky.

Goal AR-11 A wide range of County open space areas.

Policy AR 11.1 Promote the acquisition and preservation of open space areas throughout the County.

Policy AR 11.2 Create an established network of open space areas that provide regional connectivity, such as areas between the southwestern extent of the Tehachapi Mountains to the Santa Monica Mountains, and from the southwestern extent of the Mojave Desert to the Puente-Chino Hills.

Policy AR11.3 Encourage the creation of green rooftops, urban gardens and community gardens for active or passive open space uses.

Goal AR-12 A balanced and interconnected network of passive and active local parks, community parks, regional recreation areas and multi-purpose trail systems.

Policy AR 12.1 Develop and expand regional and local parkland and trail systems in the County.

Policy AR 12.2 Design parks and trails for optimal safety, security and sustainability.

Goal AR-13 Effectively managed beaches and harbors that are environmentally sensitive and accessible to the public.

Policy AR 13.1 Protect marine water quality by preserving sensitive coastal resources including marine and beach habitats and sand resources, developing pollution control measures, and requiring that all permitted uses shall comply with the U.S. Fish and Wildlife, the State Department of Fish and Game, the California Coastal Commission, the U.S. Army Corps of Engineers, the State Lands Commission, and CEQA regulations.

Goal AR-14 **Effective inter-jurisdictional coordination and collaboration in all aspects of park and open space planning.**

Policy AR 14.1 Participate in a collaborative, inter-jurisdictional system that manages and preserves County open spaces.

Policy AR 14.2 Promote joint-use agreements to increase and enhance park and recreation opportunities.

Goal AR-15 **Biological resources that are preserved and protected from incompatible land uses and development.**

Policy AR 15.1 Maintain and monitor the program and network of Significant Ecological Areas (SEAs).

Policy AR 15.3 Maximize the ecological function of the County's diverse natural habitats, such as the Joshua Trees, native Oak woodlands and perennial grasslands.

Policy AR 15.4 Participate in inter-jurisdictional collaborative strategies that protect biological resources.

Policy AR 15.5 Support the restoration and preservation of degraded areas with significant biological resources such as wetlands.

Policy AR 15.6 Promote the expansion of the tree canopy throughout the County.

Goal AR-16 **Productive farmland that is protected for local food production, open space, public health, and the local economy.**

Policy AR 16.2 Support agricultural practices that minimize and reduce soil loss and prevent water runoff from affecting water quality.

Policy AR 16.3 Support innovative agricultural practices that conserve resources and promote sustainability, such as drip irrigation, hydroponics and organic farming.

Public Services and Facilities

Goal AR 17 **County buildings that maximize energy efficiency.**

Policy AR 17.1 Expand the retrofitting of County buildings to "tune up" the energy efficiency of existing heating systems, air conditioning, and other appropriate equipment.

Goal AR-18 **A protected supply of County water resources.**

Policy AR 18.1 Support preservation, restoration and strategic acquisition of open space to preserve natural

streams, drainage channels, wetlands, and rivers, which are necessary for the healthy function of watersheds.

Policy AR 18.2 Effectively manage watersheds to balance growth and development with resource conservation and flood hazard mitigation.

Policy AR 18.3 Support the preparation and implementation of watershed and river master plans.

Policy AR 18.4 Promote the development and use of new and improved water and flood management technologies and infrastructure such as the utilization of Low Impact Development (LID) techniques.

Policy AR 18.5 Maximize the conservation of water throughout the County.

Goal AR-19 A clean supply of water to satisfy current and projected demand.

Policy AR 19.1 Support measures to improve the quality of imported and local water, groundwater supplies, stormwater runoff and desalinized water.

Policy AR 19.2 Encourage all development to provide a guaranteed supply of water.

Policy AR 19.3 Eliminate point and non-point source water pollution.

Policy AR 19.4 Encourage and support the increased production, distribution and use of recycled water to provide for groundwater recharge, seawater intrusion barrier injection, irrigation, industrial processes, and other non-potable beneficial uses.

Policy AR 19.5 Promote development of multi-use facilities for stormwater quality improvement, groundwater recharge, flood management and other compatible uses.

Goal AR-20 An updated and reliable network of wastewater systems in the County.

Policy AR 20.1 Promote innovative programs and techniques in wastewater management, such as Low Impact development(LID) practices.

Goal AR-21 Minimal waste and pollution in the County.

Policy AR 21.1 Maintain an efficient, safe and responsive waste management system that facilitates waste reduction while protecting the health and safety of the public.

Policy AR 21.2 Reduce dependence on landfills by encouraging solid waste management facilities that utilize conversion technologies and waste to energy facilities.

Policy AR 21.3	Increase to 100 percent the recycling of all recyclable materials in the County.
Policy AR 21.4	Encourage the use and procurement of recyclable and biodegradable materials throughout the County.
Policy AR 21.5	Encourage recycling of construction and demolition debris generated by public and private projects.
Policy AR 21.6	Participate in a collaborative inter-agency effort to minimize waste and pollution in the County.

ATTACHMENT C

Report in Support of the October 23, 2007 Presentation to the Board of Supervisors on Efforts to Improve Energy Efficiency and Combat Global Warming Green Building Standards for the Unincorporated Areas of Los Angeles County

Internal Services Department

Presentation to the
Board of Supervisors
On Efforts to Improve Energy Efficiency
And Combat Global Warming

October 23, 2007

Report in Support of the October 23, 2007 Presentation to the Board of Supervisors on Efforts to Improve Energy Efficiency and Combat Global Warming

Introduction

On August 23, 2007, your Board directed the departments of Regional Planning, Public Works and Internal Services to join with the Chief Executive Office and County Counsel in providing a comprehensive update to the Board at your meeting of October 23, 2007 regarding efforts to improve energy efficiency and combat global warming. ISD submits this report in support of the presentation on October 23rd describing programs ISD has undertaken to improve energy efficiency throughout County facilities and mitigate climate change impacts. The content of this report is summarized below.

Climate Change Overview and the Role of Energy Efficiency

This part of the report discusses the emphasis that the State has placed on energy efficiency in meeting climate change goals. The state's energy regulatory agencies have declared that energy efficiency is the most cost-effective way to combat climate change. Energy efficiency and renewable energy programs are anticipated to result in 27% of the State's overall GHG reduction goals under AB 32.

ISD's Energy Management Program Results and Ongoing Activities

Since the mid-1990's, ISD has implemented projects that have resulted in over $110 million in cumulative energy savings to the County. On an annual basis, those savings currently offset about 10% of the total ISD Utilities budget used in County facilities. In terms of carbon mitigation, the cumulative energy reduction due to these projects are equivalent to:

- 800 million pounds of CO2 mitigated,
- 10,000 cars taken off the road,
- 15,000 acres of trees planted.

Additional Energy Programs to be Implemented

The County Energy and Environmental Policy goal is to reduce internal energy consumption 20% by 2015. Most of the savings reductions achieved by ISD to date are through retrofitting or replacing building lighting systems and some air conditioning equipment. Beginning in 2004, ISD initiated its facility retrocommissioning (RCx) program which seeks to "tune-up" heating, ventilation and air conditioning equipment and systems in County buildings. In a typical office building, lighting accounts for about 40% of electricity use. RCx addresses a large part of the remaining electricity use and nearly all of the natural gas use in office buildings. There are approximately 500 County buildings that are RCx candidates. Other energy technologies that ISD has investigated and will pursue where appropriate included: thermal storage, distributed generation, and more widespread implementation of ISD's online, real-time energy monitoring tool (EEMIS).

Plan for Implementing Remaining Programs

ISD has received over $60 million in funding to implement these projects from a variety of sources. ISD has utilized County lease-financing and other loan agreements where loans were paid off using utility savings. ISD has received $13 million in grants from the State since 2002. More recently, in fiscal years 2006/07 and 2007/08 the CEO has allocated $5 million each year for energy projects. ISD is also including energy efficiency when prioritizing Outstanding (deferred) Maintenance items. ISD continues to utilize all existing sources and investigate new funding sources in order to achieve the 20% reduction goal.

Additionally, ISD is assisting the CEO and Public Works in implementing the requirement to certify new County construction over 10,000 square feet under the U.S. Green Building Council's Leadership in Energy & Environmental Design Silver program. ISD has also undertaken investigations into the feasibility of certifying existing County buildings under LEED or under another building operating and maintenance best practices protocol.

Additional ISD Programs that Mitigate Climate Change

On June 14, 2007, ISD's Purchasing Division released County Purchasing Policy P-1050, "Purchase of Environmentally Preferable Products" Under the purchasing policy, ISD's Purchasing Division will determine appropriate standards for green purchasing and will develop a 5-year plan to phase-in categories of certified goods. Easy to adopt purchasing categories (e.g., paper, cleaning supplies) will be implemented as soon as possible. Central purchasing agreements with a catalog of environmentally friendly and energy efficient products will be established and existing agreement databases will be modified for easy identification of green products. ISD's Purchasing Division is retaining a consulting firm to help develop environmentally preferable purchasing specifications.

Under the Board of Supervisor's "Clean Fuels" policy, adopted on January 10, 1995, all department are to report on the composition of their fleet and their progress toward acquiring clean fuel vehicles. ISD is actively pursuing the replacement of fleet vehicles with hybrids, plug-in hybrid electric vehicles, and flexible fuel vehicles. ISD is also complying with recent regulations requiring diesel powered vehicles belonging to government and utility agencies to have particulate filters installed, be re-powered with engines using the best available technology currently available, or to be disposed. This regulation requires implementation on a progressive annual scale through 2011.

Climate Change Overview and the Role of Energy Efficiency

As reported to your Board in a memorandum dated February 26, 2007, California's Global Warming Solutions Act (AB 32), which the County supported, was signed into law in 2006 and requires that production of greenhouse gases (GHG) in California be reduced to 1990 levels by the year 2020 – an estimated 30% total reduction. All businesses and constituents will be affected. As rules and regulations are adopted, immediate impacts will be felt through the cost of compliance and the higher cost of fossil fuel-related energy and purchased products. Impacts to the County's current policies and programs and the County's role in reporting its own GHG generated emissions will be addressed in ongoing state agency proceedings. The projected impact of AB 32 on historical and current GHG emissions in California is illustrated below.

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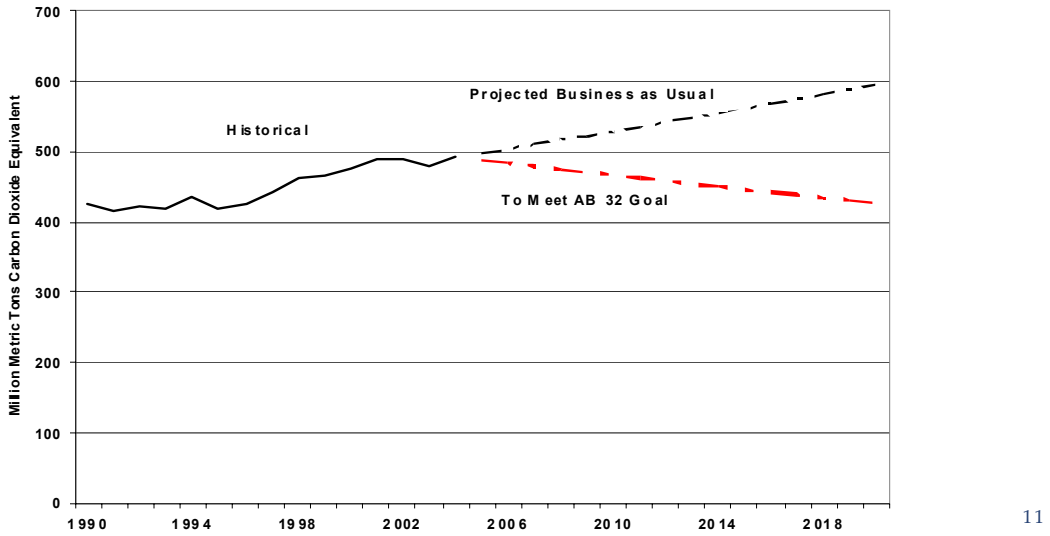

Carbon dioxide (CO2) and oxides of nitrogen (NOx) are the most common GHG; they are primarily produced through the combustion of fossil fuels. Other GHG targeted under AB 32 include methane, chlorofluorocarbons (refrigerants), and other inert gases used primarily as fire retardants and insulating materials. The chart below indicates the relative amounts of GHG produced by certain industries in California.

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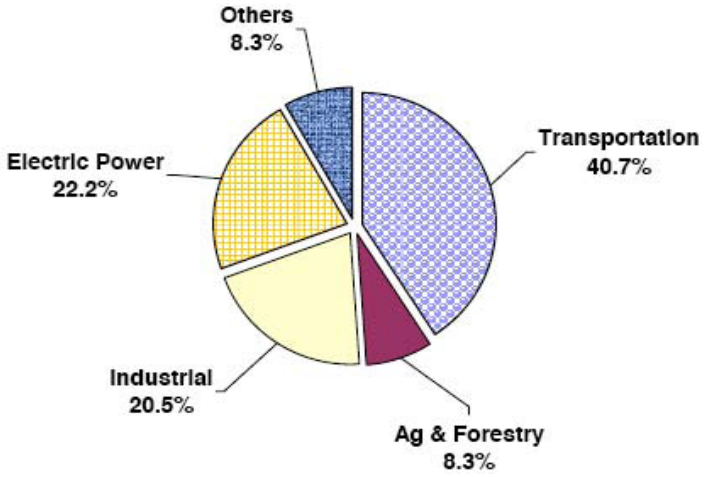
California Emissions by End-Use: Transportation/Vehicle Miles Traveled



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California's regulatory agencies have targeted specific industries from which they expect to achieve the GHG reduction goals established by AB 32. Note that energy efficiency, water efficiency and renewable power resources are 28% of the anticipated GHG reductions. This report discusses the potential in the County for contributing significant GHG reductions in these areas. County operations will also be impacted by the rules and regulations which are adopted in the areas of smart growth, clean cars and water efficiency to achieve Statewide GHG reduction goals.

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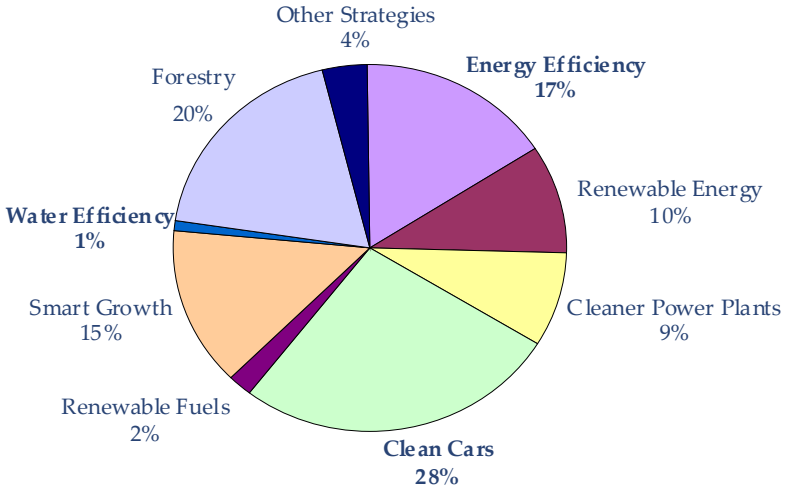
Strategies for Meeting California's CO_2 Goals in 2020
Total Reductions = 174 Million metric Tons CO_2 equivalent
i.e. 30% of projected 2020 Business As Usual CO_2 emissions



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Examples of the relative magnitudes of CO2 produced by various entities, including the County's contribution, and the magnitude of the impact of AB 32 are shown in the table below. The State's reduction targets are significant; energy/water efficiency and renewable resources will play a major role in achieving the overall reduction targets. As stated in the February 26, 2007 memorandum to your Board, ISD is tracking legislative and regulatory activities so that the County will be prepared to take advantage of legislation, regulations and other programs that will be enacted to achieve the State's goals.

Relative Contribution of CO2 Emissions – 2004	
Entity	**Total CO2 in Million Metric Tons**
Global Emissions	**20, 135**
United States Emissions	**7,074**
Total California Emissions	**492**
County operations (electricity and fuel)	**1.0**
Typical "big box" retailer	**0.022**
AB 32 reduction goal by 2020	**174**
Statewide Energy Efficiency and Renewables reduction goal	**47**

ISD's Energy Management Program Results and Ongoing Activities

ISD's Energy Management Division was created and approved by your Board in 1995. The charter for ISD's EMD is listed below.

> The department shall be the lead agency for energy audits and surveys, and the design, construction, implementation and management of the County's energy management functions, including but not limited to, the procurement of energy resources, adoption of energy conservation measures, including building and energy plant retrofit projects, and advice on energy-related regulatory matters. (Ordinance 95-0052 & 58, 1995.)

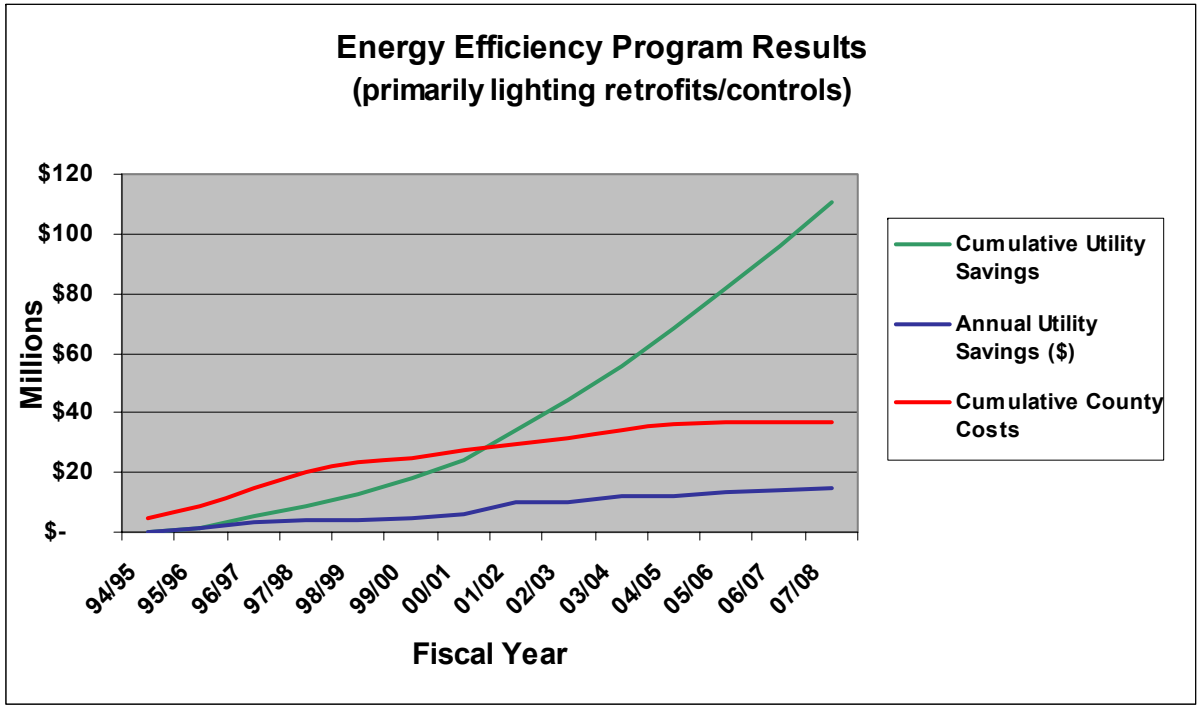
EMD has aggressively pursued and implemented a number of projects throughout a variety of County facilities. The County Energy & Environmental Policy recently adopted by your Board identified a goal of reducing County energy consumption 20% by 2015. ISD believes that this goal is feasible despite the reductions already achieved by EMD's programs. We believe a significant amount of energy savings potential remains and can be achieved through continuation of the current energy efficiency measures EMD is managing and through development and utilization of additional technologies. The results to date and remaining energy efficiency potential are discussed below.

Results to Date

The cumulative results of all the projects implemented by EMD are displayed in the graph below. Cumulative utility savings, cumulative implementation costs to the County, and annual utility savings, are derived from individual project characteristics maintained in a central, projects database. All energy savings are based on calculated project savings and, for most projects, have been verified by independent auditors. Utility budget savings are calculated using current utility and energy prices. Any changes, upgrades to, or termination of projects are noted in the database.

The cumulative utility savings of all energy projects managed by EMD includes electricity and natural gas savings projects. The projects have been implemented in Southern California Edison (SCE), Los Angeles Department of Water & Power (LADWP), and Southern California Gas Company (SCG) service territories.

Energy projects administered by EMD have resulted in cumulative savings to the County of over $110 million. The current, annual savings to the County as a result of these projects is nearly $15 million. The cumulative cost to the County for implementing these projects is about $37 million and does not include grants and incentives provided by others to implement these projects. The County's 2007/08 utility budget includes $80 million for electricity and $57 million for natural gas. The annual utility savings represents approximately 12% of the current, ISD utilities budget.



Environmental Impact of EMD Projects

The magnitude of the GHG emissions mitigated by EMD's programs is about 400,000 metric tons or over 800 million pounds of CO2. These savings are cumulative since the mid-1990's when ISD's Energy Management Division was created. In California, about 800 pounds of CO2 are emitted from local power plants for every 1,000 kwh of electricity produced. A typical home in California would be responsible for the production of 300 pounds of CO2 in a month. As stated earlier, the CO2 mitigation from these projects is the equivalent of 10,000 cars taken off the road or 15,000 acres of trees planted.

Relative Contribution of CO2 Emissions – 2004	
Entity	**Total CO2 in Million Metric Tons**
Global Emissions	**20,135**
United States Emissions	**7,074**
California Emissions	**492**
County operations (electricity and fuel)	**1.0**
Typical "big box" retailer	**0.022**
AB 32 reduction goal by 2020	**174**
Energy Efficiency and Renewables reduction goal	**47**
County energy projects results (cumulative)	**0.40**

Remaining Potential for Retrofits and RCx

The projects completed by EMD to date can be generally grouped into three major categories:

- Lighting and lighting controls retrofits,
- Heating, Ventilating, and Air Conditioning (HVAC) retrofits,
- Facility Retrocommissioning (RCx).

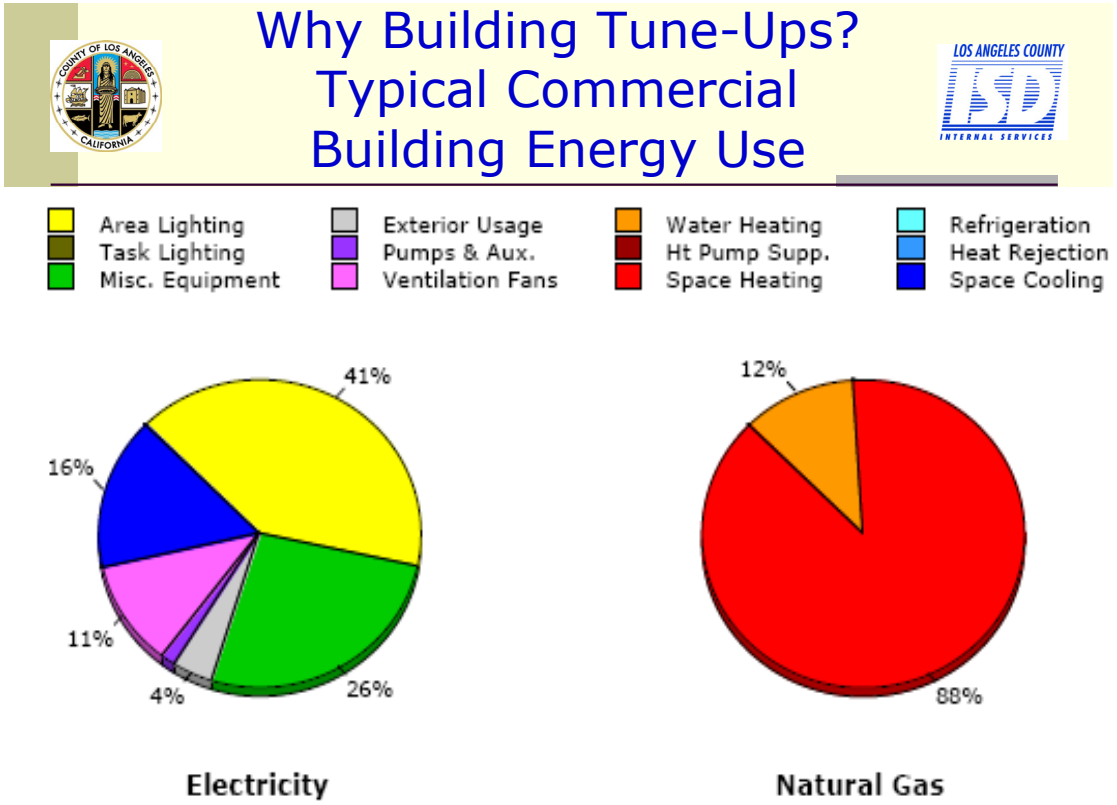
Most of the viable County facilities have already been retrofitted with industry standard efficient lighting and lighting controls. A number of smaller facilities remain to be retrofitted but they are more difficult to identify and cost-effectively retrofit. EMD is investigating working with Southern CA Edison (SCE) and the Los Angeles Department of Water & Power (LADWP) to retrofit these smaller, hard-to-reach facilities. For the most part throughout the County, most energy efficiency savings potential in lighting has been fulfilled except for retrofitting small facilities and converting to newer lighting technologies.

Significant facility savings have been seen in the small number of facilities retrocommissioned so far under EMD's RCx program. RCx involves a more holistic approach to improving facility HVAC systems and equipment than simply retrofitting HVAC equipment. EMD's RCx program also includes conducting comprehensive audits and modeling of the systems, making maintenance repairs which improve efficiencies, replacing or improving control systems, and re-programming operating sequences. To date, in a limited number of buildings, Implementing all of these measures within a facility HVAC system has resulted in an approximate 20% improvement in electricity usage and 40% improvement in natural gas usage. Replacing HVAC equipment is now part of the typical RCx project scope.

The table below shows the results of ISD's energy projects to date in terms of cumulative savings and annual savings. It also indicates the amount of viable, County building square footage that has already had lighting retrofits implemented. These results show the RCx savings realized in 15 County sites which comprise about 12% of the building square footage that could be retrocommissioned. About 500 large and medium size County facilities are RCx candidates. Although the scope of RCx will vary by building size and complexity of HVAC systems, industry research indicates that worthwhile energy efficiency savings can be achieved in these facilities. HVAC retrofits, i.e. replacing HVAC equipment, is routinely done as a part of facilities maintenance. The HVAC retrofits indicated in the table below account for retrofits that occurred as part of an ISD energy project. HVAC retrofits are also conducted by other departments as a part of routine maintenance; the energy savings from this work is not reflected in the table below. HVAC retrofits are now a typical investigation and measure in RCx.

Measure	Cumulative Utility Savings ($ million)	Annual Utility Savings ($ million)	Annual Savings as a % of Latest Utility Budget	% of Viable Square Footage Implemented
Lighting & Lighting Controls	91.6	10.8	10.2	76%
HVAC Retrofits*	11.5	1.4	1.3	no data
RCx	2.0	1.5	1.4	12%
* remaining HVAC retrofits will be completed under facility RCx program and maintenance				

The chart below illustrates that, outside of lighting, most of the remaining building energy use functions comprise HVAC systems used to create heating and cooling and distribute heating and cooling through the buildings. RCx targets the approximate 30 to 40% of the typical office building electricity consumption used in HVAC systems. Nearly all of a typical building's natural gas consumption is used for building heating systems and is targeted under RCx. RCx represents a cost-effective and worthwhile program to capture energy savings in County facilities.



Additional Energy Programs to be Implemented

In addition to retrofits and RCx, a number of other energy efficiency programs and technologies can be implemented into County facilities. The programs target energy savings that can be achieved through enhancing County conservation efforts; targeting specific, unique types County facilities operations; and enhancing facility operations and maintenance. The programs are listed below are described briefly in this section.

- Enterprise Energy Management Information System (EEMIS) and County Conservation,
- Thermal Storage,
- Demand Response,
- Cogeneration – Combined Heat and Power (CHP) and Existing Plant Improvements
- Water Conservation/Efficiency

EEMIS and County Conservation

In 2002, EMD implemented EEMIS; an internet-based, real-time energy management information system. EEMIS automatically gathers an unlimited amount of facility operating information and utility bill information and archives it indefinitely. EEMIS can be more widely implemented throughout the County to enhance conservation and efficient building operation.

EEMIS allows County facility managers, energy management staff and building proprietors to observe "real-time" energy consumption via the internet. The immediate impacts of energy projects, operational changes, and behavioral changes like voluntary demand reduction can be observed through this functionality. Currently about 150 of the County's largest facilities are monitored by EEMIS.

EEMIS is also used to analyze consumption trends using utility bill information. The impacts of energy efficiency, retrocom-

missioning, and other projects over months and years can be monitored using this functionality.

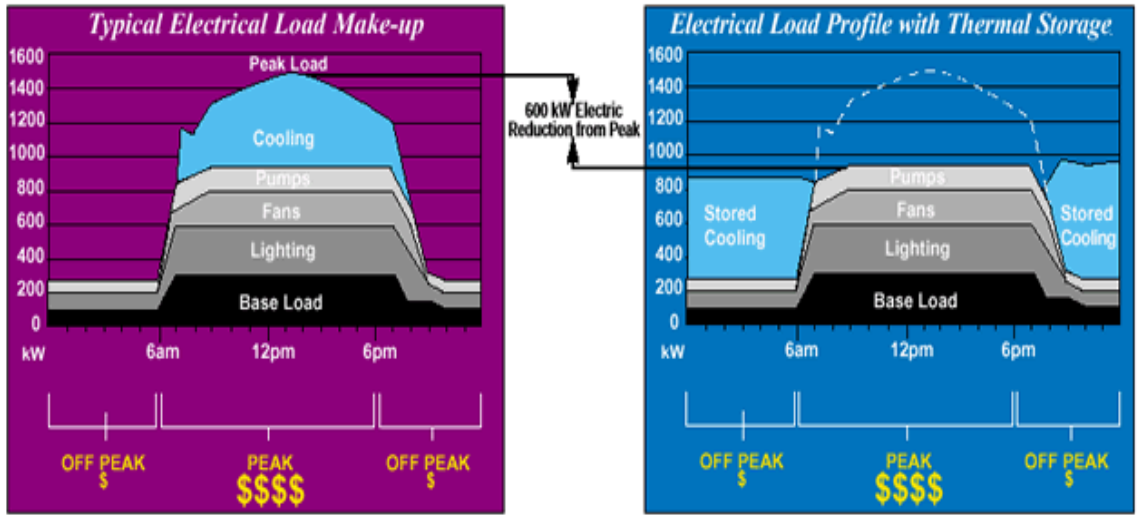
EEMIS has proved to be an invaluable reporting and training tool for facilities personnel to observe patterns, trends and characteristics of their building. EMD's RCx program now requires development of a facility training manual for new operating and maintenance measures implemented into the facility. The approximately 500 County facilities that are RCx candidates should be placed into the EEMIS system. As County facilities are retrocommissioned, EEMIS will be implemented and utilized for operations training.

Thermal Storage

Around 1991, the proposed Men's Central Jail design included incorporation of thermal storage. The thermal storage system, for whatever reason, required significant re-engineering and was the subject of litigation that was only resolved within the past several years. Unfortunately, that incident has tainted the County's perception of the benefits of thermal storage to this day.

Fundamentally, thermal storage systems create and store ice or cold water in tanks during off-peak electricity hours when electricity prices are lowest. During peak hours when electricity is most expensive, water is pumped through the stored ice or cold water and circulated through buildings to provide cooling for work spaces or equipment. The benefits of thermal storage accrue because of the large difference between off-peak and on-peak electric rates. Thermal storage reduces peak period demand for power which assists in meeting the State's power demand and avoiding outages.

Thermal storage has been successfully utilized at other County facilities. The Century Regional Justice Center, Pitchess Jail, Challenger Juvenile Detention Center and the re-designed Twin Towers have been receiving the benefits of thermal storage for as much as 20 years in some cases. Thermal storage should be a standard design option to be evaluated in new facilities and in retrocommissioning existing facilities. Below is an example that illustrates the economic benefits of thermal storage.



Demand Response

In light of the State's recent power supply and demand problems, a new industry – demand response - has developed to help reduce power demand during critical periods. When demand is high and power supplies are critically short, the State has developed programs where financial incentives are provided to customers to immediately reduce power use during State initiated emergency events. Demand response programs have been credited with avoiding rotating outages in the past. The total amount of power that the utilities have under contract with customers to reduce power on demand is about 3,000 megawatts or 6% of the state's maximum power demand. Recall that stage alerts are called when demand is within 5% of State power supplies; demand reduction is an important factor in balancing supply and demand.

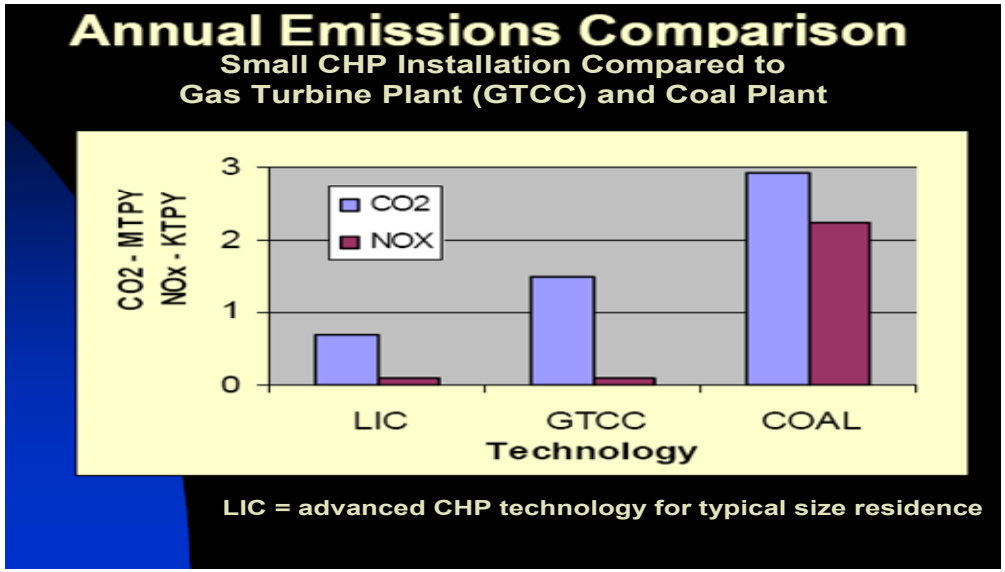
Most demand response measures include automatically increasing thermostat points and shutting off a portion of operating systems like lights, elevators, escalators, fountains, etc. EMD has studied demand response technologies for County office buildings and concluded it is difficult to implement cost effectively. In light of the "real-time pricing" programs that will eventually be fully implemented throughout the State, EMD will conduct further, more in-depth studies of the feasibility of utilizing demand response in County facilities.

Cogeneration - Combined Heat and Power (CHP)

Cogeneration or combined heat and power (CHP) is not new technology. Cogeneration plants under contract with SCE provide about 15% of their total power supply portfolio. The County's Pitchess cogeneration plant is such a plant. The Civic Center cogeneration plant and the Olive View Hospital cogeneration plant operate under agreements to provide LADWP with power. As electricity and natural gas prices have risen, CHP technologies are becoming more feasible and are being utilized in smaller facility applications.

In a typical facility electricity is provided by the utility supplier and is used to run air conditioning and cooling equipment. Natural gas is provided by the utility supplier to run heating equipment. CHP utilizes electric generating equipment to produce on-site electricity; the waste heat by-product of that equipment is then used to provide facility heating and cooling. Utilization of this waste heat makes CHP economical, especially in facilities that operate around the clock requiring electricity for operations, heating and cooling. These facilities include hospitals, jails and other detention facilities, computer centers, and industrial operations. CHP is also becoming more attractive because the combined efficiencies typically produce less GHG than those produced when receiving both electricity and natural gas from a utility supplier for individual systems and equipment.

Below is a case-study of the GHG benefits of a residential size CHP installation. This example presents the CO2 and NOx reduction benefits (in millions of tons per year and thousands of tons per year) compared to typical utility power plants based on equivalent power production hours.



CHP is being re-evaluated by the State and the Federal government because of its inherent energy efficiency and GHG mitigation benefits. The CPUC is examining CHP program incentives to promote more installations to meet GHG reduction goals. Proposed State legislation seeks to remove regulatory barriers and similarly increase incentives for CHP. Both Senate and the House proposed Federal energy bills (as of September of 2007) contain sections which will create incentives for CHP, especially for local governments.

Cogeneration Plant Improvements

As mentioned earlier, the County's three cogeneration plants represent about 65% of the County's total natural gas budget. Natural gas is used for power production and the process waste-heat is utilized for facility heating and cooling processes; the cogeneration plants are already inherently efficient. However, because of the significant volumes of gas used in a handful of facilities any efficiency improvement can have significant impacts on the County's overall consumption.

EMD, which operates and maintains the three plants, has begun assessing and implementing plant improvements as natural gas prices have recently increased. In addition to replacing older equipment with higher efficiency units, EMD is also looking to improve the efficiency of the power generating units.

As an example, EMD recently installed equipment which increased the output of the generator at Civic Center cogeneration plant during peak summer periods (when revenues for power sold to the utility are the highest). This improvement involved cooling the combustion air used by the gas turbine; cooler air increases power output of the turbine. This modification was implemented in 2005; it cost $ 1 million and resulted in increased revenues of about $800,00 in the first year.

EMD and the Sheriff's Department are collaborating on a similar enhancement project at the Pitchess cogeneration plant. This project should begin in early 2008.

Water Efficiency

EMD is working with Public Work's Office of Reclaimed Water to begin prioritizing County sites for reclaimed water use and will continue to participate in that Office's regular, program development meetings. Other water efficiency technologies for existing County facilities are being examined and evaluated under LEED Existing Building feasibility studies that are described later in the report under the Green Building Operations Program.

The state has initiated a series of studies to determine the overall electricity savings realized through conservation of water. That is, by installing low-flow water fixtures, electricity savings should be realized through reduced water pumping and distribution. Additionally, electricity savings (and methane reductions) should also be realized in reduced wastewater treatment operations. The State intends to create electricity rebates or incentives based on water conservation and efficiency measures. In anticipation of this, EMD is working with DPW's Waterworks Division and Sewer Maintenance Division to retrocommission their facilities and to possibly assist the State in their energy/water nexus studies.

Lastly, ISD is installing waterless urinals in its Administrative Headquarters this fiscal year and will document water savings versus maintenance costs and develop recommendations related to expansion of this technology.

Renewable Resources

Solar power, wind power, fuel cells, solar heating and other renewable resources are discussed here although some resources (in particular solar power and wind power generation) are not necessarily energy efficient technologies. Other renewable resource applications can be efficient. Fuel cell technology converts natural gas into its base elements and produces heat as a by-product; it can be used in a CHP application. Solar water heating is commonly used for domestic water heating. Recently, ISD addressed your Board regarding legislation intended to provide incentives for solar water heating installations.

Most renewable resource power installations require significant incentives to bring simple payback periods to acceptable levels. Installing solar or wind power has primarily been done in response to environmental policies or desires. That will be

changed under AB 32 regulations and other climate change legislation. Renewable resources are a significant technology in mitigating GHG. Recall the State's targeted areas for reaching AB 32 goals; renewable resource installations are expected to contribute 17% of the targeted reduction. This means incentive programs for renewables will likely be enhanced; additionally the credits for reducing GHG through renewables will have economic value.

To the best of ISD's knowledge, there are no renewable resource installations anywhere in the County. EMD has not implemented a renewable resource technology under its Energy Management program; primarily because these installations have always been solely evaluated under the criteria of simple payback based on individual project cost and annual savings. One approach would be to implement an appropriate renewable resource project at a facility in conjunction with RCx or other cost-effective measures thus providing a more moderate overall payback for the entire group of projects. Another strategy, especially where LEED certification is a goal, would be to purchase green energy credits for a facility from the providing utility. The green credits earn LEED certification points and are available at a slight premium (about 15-20%) over the cost of energy otherwise supplied by the utility. This premium is included in the utility bill and would be part of a facility's operating costs and not part of project capital costs.

Given the changing attitude on the environment and the anticipated, enhanced industry support for renewables, EMD will continue to include renewable resources as an energy and climate change option in its project evaluation.

Plan for Implementing Remaining Programs

Past Funding Sources

EMD has utilized a variety of funding sources to implement past and ongoing energy projects. Much of that funding has come from outside, non-County sources. Those funding sources are illustrated in the following chart and described below. Included in each funding source description is a history of its use, and its benefits and limitations. All current and past funding sources may be relied upon to meet the Policy energy reduction goal and to enhance GHG reductions in the County.

Funding Source	Amount (millions)	Time Period
Utility Incentives	$10.0	1995 – 1998
County Capital Lease*	$18.0	1997 – 1999
Productivity Investment Fund Loans*	$6.0	1999, 2006
CPUC Funding	$13.0	2002 – 2008
County Budget*	14.0	2001, 2006, 2007
* Total - County Cost	38.0	
Total	$61.0	

Utility Incentives

In the mid to late 1990's, the State's investor-owned utilities provided an incentive program which was specifically designed to defer the construction of new power plants. As such, the incentives were designed to be equal to the utilities cost to build a power plant on a $ per kilowatt basis. In other words, the incentives were very generous, were made available at the onset of and during project construction, and could pay for the entire cost of some projects. These programs allowed the County to complete much of the lighting retrofits in SCE territory. The program ended in 1998. Today, utility incentives primarily consist of rebates which are provided at much lower incentive levels than this earlier program. EMD will ensure all energy efficiency projects that are implemented using other funds will acquire any available utility incentive.

County Capital Lease Program

During the late 1990's and into the early 2000's, the CAO's Capital Projects Program financed EMD's energy efficiency projects using a capital lease financing program administered by their office. Energy efficiency projects are ideal for financing because they produce quantifiable utility savings with reasonable payback periods and they can be determined beforehand. To satisfy the CAO's office and the lender, EMD required contractors to "guarantee" the amount of savings from the projects. The project savings were calculated before the project and verified after the project; the contractor guaranteed a minimum amount of utility savings as payment to the lender. ISD's utility budget retained any additional savings beyond the guaranteed payment.

EMD completed lighting and HVAC retrofits, primarily in LADWP service territory, using this funding source. To the extent other funding, EMD will pursue the use of either the CEO's administered capital lease financing program or third party financing which is readily available. In particular, the California Energy Commission offers low-interest loans to local governments and public agencies for qualified energy efficiency projects. EMD is currently working with County Counsel to determine the County's ability to utilize third party financing.

Productivity Investment Fund (PIF) Loans

The County's Quality and Productivity Commission provides Productivity Investment Fund (PIF) grants and loans for projects which enhance the County's operations and infrastructure. For the reasons mentioned above, energy efficiency projects are ideal candidates for the PIF program. The PIF program was beneficial to EMD because it provided funding for all service territories and is available in the event no other funding sources can be utilized. EMD will utilize PIF loans within their qualification requirements and payback restrictions in the event other funding is not available.

In 1999, EMD received a $3.1 million loan primarily for lighting retrofit projects in LADWP service territory. In 2006, EMD received another $3.1 million loan for RCx projects and retrofit projects in LADWP territory.

CPUC Grant Program

In 2002, the State created energy efficiency programs allowing third parties to competitively bid to work in partnership with SCE and the Southern CA Gas Company (SCG) to implement prescribed energy efficiency measures and achieve targeted energy efficiency cost/savings goals. The County submitted a proposal and was awarded a contract with SCE and SCG for $3.3 million to continue EMD's lighting and HVAC retrofit program. The costs and savings benefits of these County projects were so cost effective that 100% of the project costs were funded.

By 2004, this program had evolved into a County/SCE/SCG Local Government Partnership partly due to the success of the 2002 County program. The State recognized the benefits and resources local governments provide in achieving energy efficiency and created the Local Government Partnership program specifically for local governments and absent the third party competition. The County contracted with SCE and SCG for $3.7 million to continue retrofits and initiate EMD's RCx program.

In 2006, the County/SCE/SCG partnership was awarded $6.0 million to conduct RCx in County facilities through the year 2008. The facilities to be retrocommissioned under this program include: Rancho Los Amigos Hospital, Dorothy Kirby Pro-

bation Camp (and powerplant) and the Public Works Headquarters. In all, approximately 30 facilities will be retrocommissioned under this program.

A 2009-11 Local Government Partnership program has been announced by the CPUC. ISD, likely in partnership with SCE and SCG again, are planning the elements of this program. EMD is investigating the potential to include the program elements described below.

- Retrocommissioning DPW's Waterworks and Sewer Maintenance Systems
- Providing energy efficiency improvements in Public Housing facilties
- Assisting in developing and piloting the Green Building/LEED Certification program for County unincorporated areas (this study is being conducted at the Board's request by Regional Planning and Public Works)
- Providing assistance in the County's LEED Silver NC program (being administered by the CEO and Public Works) and the LEED EB program being investigated by ISD and Public Works.
- Developing a regional energy office that could provide energy management assistance to local public agencies and governments that have little or no in-house energy management resources

The CPUC's program has benefited the County during periods when no other energy efficiency program funding was available. EMD has developed its relationships with SCE, SCG and the CPUC to the point where the County is viewed as a valued and reliable partner in helping the State achieve its energy efficiency goals. We anticipate that as long as Local Government Partnership programs exist within the CPUC's energy efficiency portfolio, the County will participate. However, competition for funding has increased and it is imperative that the County contribute some element of program funding to keep its program cost effective and competitive compared to other partnerships and programs. In addition, CPUC funding is only to be used in SCE and SCG territories.

County Budget

EMD recognizes the ability of the County to appropriate funds for energy projects depends on the health of the County's budget and the priority needs of other programs and services run by County departments. This is why EMD has gone to such great lengths to identify and utilize other funding sources. The value of any County appropriation is that it can be used on any technology, in any service territory, and with less administrative oversight. In 2006, ISD made a presentation to the CEO's budget staff illustrating the results and benefits of EMD's programs, similar to the information provided in this report. The CEO approved a $5 million budget line item request in ISD's Utilities Budget to be used to implement projects and enhance energy efficiency throughout the County under the 2006/07 budget. The CEO also appropriated another $5 million for 2007/08.

Funding from the County's budget is critical to meeting the 20% energy reduction goal by 2015. This funding is used in conjunction with all of the other funding sources described above to ensure each program's qualification criteria can be met and that work in all utility territories can be done. Continuing ongoing RCx projects and implementing the additional energy programs are critical in developing further energy efficiency gains to reach the Policy goal, preparing the County for new market regulations, and further reducing County GHG production.

Additional ISD Programs that Mitigate Climate Change

In addition to funding for energy efficiency projects, EMD is working with others on existing programs which provide opportunities to achieve energy efficiency gains in County facilities. Through increased coordination with other County organizations, energy efficiency gains will be achieved as part of the County's Capital Project Program, a Green Building Operations program under development for existing County facilities, and ISD's Outstanding Maintenance program. Further energy efficiency gains and GHG mitigation will be achieved under ISD's Environmentally Friendly Purchasing Policy and ISD's green fleet management activities.

New Building LEED Certification

The County's Energy & Environmental Policy directs the CEO and Public Works to develop a sustainable design program for the County's Capital Construction Program and promote sustainable County operations practices. On January 16, 2007 the Board directed that the Capital Construction Program achieve LEED Silver Certification for new buildings greater than 10,000 square feet. The County's proposed 2007/08 Capital Program reflects 53 projects that have been designated for the sustainable design program. Further, 20 of the projects will be certified at the LEED Silver level or higher. LEED certification for new buildings requires that building systems be rigorously commissioned to ensure they are operating properly and efficiently when construction and testing are completed. Commissioning a building's heating, ventilating and air conditioning (HVAC) systems establishes the benchmark against which the system's energy performance will be measured in future years to determine if the building is in need of retrocommissioning and ensure long term energy savings.

ISD is working with the CEO and Public Works to utilize ISD's retrocommissioning experience in the commissioning of new buildings. ISD's retrocommissioning projects have been partially funded by the CPUC and, as a result, those retrocommissioning standards and procedures have been reviewed and approved by our utility companies and by 3rd party auditors.
In addition, ISD is working with the CEO and Public Works to implement EEMIS monitoring in new building construction.

Using EEMIS to store a building's commissioning information ensures that an energy performance baseline is established, continuously evaluated and benchmarked against other facilities.

Utility companies now offer incentives for energy efficiency designs in new buildings and major renovation projects. These funds are available during the design and procurement phases of projects and can offset the higher cost of more efficient equipment. The Team will work with the CEO and Public Works to facilitate the application and receipt of these incentives.

Existing Facilities - LEED Existing Building (EB) Studies

ISD is exploring a comprehensive and consistent methodology for implementing energy efficient and sustainable practices into existing County building operations through LEED EB certification or other building standard. LEED EB differs from LEED NC (new construction) in that certification points are achieved primarily from existing building/site operating and maintenance practices. LEED EB categories include: site sustainability, water and energy efficiency, indoor air quality, source waste reduction and waste diversion, and sustainable operations and maintenance. These categories encompass green purchasing, recycling, landscape and building operations and maintenance practices, and comprehensive energy management.

Two studies are underway to determine the feasibility of achieving LEED EB certification in existing County facilities. The two sites being examined are the Public Works Headquarters Tower building and the ISD Administrative Headquarters. Their age and size is representative of most medium and large County office buildings. The studies will be completed by the end of 2007.

Energy Efficiency Criteria on Outstanding Maintenance

At the request of the Board, ISD has incorporated energy efficiency savings into its formula for prioritizing Outstanding Maintenance items. The goal of such a program would be to identify high priority outstanding maintenance items and develop a significant energy incentive that would be used to encourage departments or the CEO to provide remaining funding for the project. EMD's available energy efficiency funding sources will be utilized to provide a custom, internal County in-

centive program. Ideally, this type of internal, incentive program would allow more projects to be completed than if energy projects were solely, 100% funded by EMD's energy project funding.

Environmentally Preferable Purchasing Policy

The Countywide Energy and Environmental Policy states that the Policy Team will investigate requirements and preferences for environmentally friendly packaging, place greater emphasis on recycled products, and maximize energy efficiency as part of the development of an environmentally responsible purchasing standard. On June 14, 2007 ISD's Purchasing Division released County Purchasing Policy P-1050, "Purchase of Environmentally Preferable Products" which establishes objectives for County purchases that:

- Conserve natural resources;
- Minimize environmental impacts such as pollution and use of water and energy;
- Eliminate or reduce toxics that create hazards to workers and our community;
- Support strong recycling markets;
- Reduce materials that are put into landfills;
- Increase the use and availability of environmentally preferable products that protect the environment;
- Encourage manufacturers and vendors to reduce environmental impacts in their production and distribution systems;
- Create a model for successfully purchasing environmentally preferable products that encourages other purchasers to adopt similar goals.

Under the purchasing policy, ISD's Purchasing Division will determine appropriate standards for green purchasing and will develop a 5-year plan to phase-in categories of certified goods. Easy to adopt purchasing categories (e.g., paper, cleaning supplies) will be implemented as soon as possible. Central purchasing agreements with a catalog of environmentally friendly and energy efficient products will be established and existing agreement databases will be modified for easy identification of

green products. ISD's Purchasing Division is retaining a consulting firm to help develop environmentally preferable purchasing specifications.

The California State Association of Counties, in coordination with ISD's Purchasing Division, hosted a regional green purchasing seminar on August 23, 2007 at Public Works' Event & Training Room B beginning at 1:00pm. The event featured nationally recognized experts sharing knowledge on local government green purchasing best practices and tools necessary to implement and achieve green purchasing goals. The event was well attended with over 100 persons representing many local governments in the Los Angeles County region participating.

Clean Fuels Program

The Board of Supervisor's "Clean Fuels" policy was adopted on January 10, 1995. The policy requires that by March 1 of each year, departments report on the composition of their fleet and their progress toward acquiring clean fuel vehicles.

The ISD-maintained motor vehicle fleet includes 3,833 powered vehicles. Currently, 286, or 7.5% of these vehicles are alternative fuel vehicles (AFV's). The report below shows that County departments purchase a variety of alternative fuel types including hybrid, electric, natural gas, bi-fuel, flex-fuel and propane. Also reflected is information captured to date on certified low emission vehicles (LEV's) and ultra-low emission vehicles (ULEVs) as defined by the California Air Resources Board for 1,400 vehicles examined. ISD will continue to examine and record emissions for the remainder of our fleet and all new vehicles.

Hybrid Vehicles

During the last year, ISD has actively pursued avenues to help County departments learn about and acquire hybrid sedans in support of the November 2005 Board of Supervisors direction for departments to acquire hybrid sedans for routine, non-emergency County business, whenever practical and economically feasible, beginning no later than July 1, 2006. The following actions were taken during this report period:

- In Spring 2006, the shortage of hybrid vehicles limited the County's ability to acquire hybrid sedans. ISD worked with 2006 Board Chair, Zev Yaroslavsky, to notify Toyota and Honda corporate offices of our concerns on the limited number of hybrid Prius and Civics being made available for sale to government and commercial fleets nationwide. As a result, Toyota committed to a significant increase in the allocation of Prius hybrids to Los Angeles County. The allocation is currently 10 – 20 vehicles per month.
- ISD's Purchasing and Contracts created an exemption from year-end purchasing deadlines for hybrid vehicle requisitions and periodically encourages County Administrative Deputies, Materials Managers, and Vehicles Coordinators to submit hybrid vehicle requisitions early in the year to ensure vehicle acquisition from our annual allocation.
- ISD established a new approach to bidding the County's requirement for hybrid vehicles. This resulted in an award to Toyota with significantly improved pricing and delivery timeframe.

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- As a result, County departments purchased 104 hybrid sedans in calendar 2006. Many more hybrid sedans are currently on order.
- Additionally, ISD worked with Toyota to schedule the Mobile Hybrid Experience at the County's October 11 and 12, 2007 Clean Air Ride Share County Employee Event. The objective of the Hybrid experience is to increase awareness and education of hybrid technologies, alternative fuels, and the benefits of hybrids. Toyota's Highway to the Future trailer is designed to have several interactive and hands-on exhibits.

Plug-In Hybrid Electric Vehicles

Plug-In Hybrid Electric Vehicle (PHEV) technology has now been added to our County fleet in collaboration with the Quality and Productivity Commission. ISD purchased and dedicated two Toyota Prius which were retrofitted from electric/gasoline hybrid technology to PHEV technology on September 20, 2007. The Quality and Productivity Commission funded a grant to

ISD for the PHEV conversion cost.

This emerging technology involves adding greater battery capacity and a battery charger that can be plugged into a conventional electrical outlet from the hybrid vehicle. This allows the converted vehicle to increase the range it can travel on an electric charge, decrease its use of gasoline, and greatly improve the vehicle's overall miles per gallon (mpg) performance. It has been reported that PHEVs are capable of achieving 200 mpg at low speeds (less than 55 miles per hour) and with mild acceleration. Although other sources suggest a realistic rating is 100 mpg overall. These vehicles may be capable of traveling distances of up to 40 miles on battery charge alone, during which no gasoline is used.

ISD will work with other County departments to evaluate the PHEV usefulness to perform County missions and the fuel savings.

ISD Flexible Fuel Vehicles Initiative

Flexible Fuel Vehicles (FFV) are capable of running on conventional gasoline or E85 ethanol. Ethanol is a renewable fuel produced in the United States from grain such as corn, barley and wheat. E85 fuel consists of 85% ethanol and 15% gasoline. This alternate fuel burns cleaner than gasoline, helps reduce air pollution, and reduces the consumption of petroleum.

Currently, there are 14 FFV sedans (only 0.4%) in the ISD-managed County fleet. However, there are no E85 fueling stations in Los Angeles County. To allow us to fuel our FFVs and investigate the benefits of FFV usage, ISD will be converting one of our gasoline fueling stations to an E85 fueling station at our Eastern Avenue complex. ISD has obtained a grant from the Quality and Productivity Commission to fund the conversion of the fueling station and an FFV pick up truck to add to our fleet for testing it's suitability for performing typical County missions.

ISD is currently working with the California Air Resources Board and the South Coast Air Quality Management District to obtain required approvals and permits to convert one of our fueling tanks at the Eastern Avenue complex to an E85 fueling site.

New Regulation for Diesel Vehicles

Although diesel engines provide efficiency and fuel economy for heavy duty vehicle uses, these engines are a source of particulate matter (a toxic air contaminant) and gaseous pollutants such as unburned hydrocarbons, nitrogen oxides, and carbon monoxide. On January 3, 2007 a new regulation (California Code of Regulations, Title 13, Section 2022) went into effect requiring diesel powered vehicles belonging to government and utility agencies to have particulate filters installed, be re-powered with engines using the best available technology currently available, or to be disposed. This regulation requires implementation on a progressive annual scale through 2011.

ISD identified affected vehicles and estimated costs for installing particulate filters on County diesel vehicles managed by ISD. The information was provided to Administrative Deputies for County departments in September 2006 and ISD Fleet staff began to work with departments to evaluate the vehicles and determine the best course of action for departments based on usage. Responsiveness from departments has been very encouraging. As shown below, ISD-managed diesel vehicles are well within the required compliance for 2007.

GROUP	ENGINE MODEL YEARS	PERCENTAGE OF GROUP TO USE BEST AVAILABLE TECHNOLOGY	RESULTS	COMPLIANCE DEAD-LINE: DECEMBER 31ST OF:
1	1960-1987	20% 60% 100%	26%	2007 2009 2011
2	1988-2002	20% 60% 100%	42%	2007 2009 2011
3	2003-2006 (Includes dual-fuel and bi-fuel engines)	50% 100%		2009 2010

Hydrogen Fuel Cell

Along with other alternative fuel sources, hydrogen fuel cell power will help California meet Governor Schwarzenegger's greenhouse gas emission reduction target of 80 percent below 1990 levels by 2050. To support this effort, the State of California created the California Hydrogen Highway initiative to catalyze hydrogen transportation infrastructure throughout California. Additionally, the California Fuel Cell Partnership (a collaboration of auto manufacturers, energy providers, government agencies, fuel cell technology companies and transit agencies) is working together to promote the commercialization of hydrogen fuel cell vehicles.

For example, General Motors (GM) plans to introduce a dedicated, hydrogen powered Saturn VUE, a compact SUV. ISD has confirmed our interest to be included in GM's hydrogen platform group for testing and evaluating the Saturn VUE. If selected, we will be allowed to drive and evaluate this hydrogen powered vehicle during the test period. GM will name the participants selected in late calendar year 2007 and testing is planned for early 2008.

Additionally, ISD Management met with American Honda Motor Co. in late September 2007 to learn about Honda Fuel Cell

Vehicles and discuss opportunities for government partnership.

ISD will continue to explore alternate fuel vehicles, pilot new technology, educate County departments, and recommend amendments to the Clean Fuels Program Policy as necessary.

Conservation Technologies For County Parking Structures

ISD will investigate qualifying County parking structures for certification as LEED facilities and will examine current and emerging "greening" technologies and best practices for parking structures including:

- Sustainable solar power for lighting and exhaust turbines,
- Water conservation and run-off capture strategies,
- Accommodations for alternate fuel vehicles (e.g. electric, fuel cell, CNG, etc.),
- Energy efficient mechanical systems.

Advance Vehicle Environmental Initiatives

To promote environmental stewardship, ISD will explore potential County applications to expand uses for alternate fuel vehicles (e.g. dedicated electric vehicles such the GEM or THINK). ISD will also examine current vehicle preventive maintenance intervals and develop a strategy to reduce the current consumption of petroleum based products (e.g. oil, transmission fluids, etc.) while ensuring properly functioning County Fleet and reducing the quantity of hazardous materials generated.

Conclusions

EMD's energy management program has saved the County over $110 million in cumulative utility avoided costs since its inception in 1994; most of this is a result of lighting technology retrofits. Most of the viable County facilities have undergone lighting retrofits; this has taken a little over 10 years. Significant energy savings can be realized through additional energy efficiency technologies and measures such as:

- Further facility retrocommissioning of HVAC systems,
- Widespread implementation of EEMIS for conservation purposes,
- Implementation of additional technologies such as thermal storage, demand reduction, cogeneration or combined heat and power, power plant improvements, and water efficiency projects;

Because of this large remaining potential, it is realistic that the County Energy & Environmental Policy goal of reducing County energy consumption 20% by 2015 can be attained. Energy efficiency will remain a high priority in the State not only in maintaining energy security and reliability but also in helping the State meet its GHG reduction goals under AB 32 and other climate change legislation. The County, through ISD's energy management and other climate change programs is well positioned to help the State achieve its goals and capitalize on State programs that assist entities in doing that.

Additional energy savings and climate change benefits will be realized through the development and implementation of these programs:

- Implementation of renewable energy resource projects especially where they can be combined with other energy projects to reduce overall cost/payback impacts and where significant incentives are available,

- Widespread application of energy efficient equipment and systems through the County's Capital Project Program including LEED Silver certification of new facilities,
- Development of a County existing building best practices operating and maintenance program which may include LEED EB certification or another standard,
- Implementation of energy efficiency projects under ISD's Outstanding Maintenance program,
- Implementation of widespread green and sustainable procurement through the development of ISD's Environmentally Friendly Purchasing Policy,
- Use of greener fleet fuels and efficient fleet vehicles under ISD's Green Fleet Management program.

During the Board meeting of August 28, 2007, your Board indicated that the problem of global warming is closely related to the Country's continuing reliance on fossil fuels and contributes to this region's chronic air quality problems. In addition your Board stated that it is important to ensure that the County moves forward on initiatives such as outlined in the recently approved County Energy & Environmental Policy; including the 20% County energy use reduction goal, the LEED Silver mandate for new County buildings over 10,000 square feet and the development of standards to improve energy and water efficiency in private development within the County's jurisdiction. This report indicates that ISD is moving forward on such initiatives.

LOS ANGELES COUNTY
ISD
INTERNAL SERVICES

Dave Lambertson
Director

COUNTY OF LOS ANGELES
Internal Services Department
1100 North Eastern Avenue
Los Angeles, California 90063

To enrich lives through effective and caring service.

Telephone: (323) 267-2101
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August 1, 2007

To: Each Supervisor

From: Dave Lambertson
Director

Subject: **COUNTYWIDE ENERGY AND ENVIRONMENTAL POLICY TEAM UPDATE REPORT**

This memo provides an update on the accomplishments and activities of the Energy and Environmental Policy Team (Team) created through your Board's approval of the Countywide Energy and Environmental Policy (Policy) on January 16, 2007. The Policy states that the Team shall report back to your Board every 6 months.

TEAM ORGANIZATION

The Team is led by the ISD and includes representatives from County Counsel, Chief Executive Office, Department of Public Works, Department of Parks and Recreations, Sheriff's Department, Public Library Department, Department of Health Services, Department of Public Health, Department of Community and Senior Services, Community Development Commission, Southern California Edison, Southern California Gas Company, and the Los Angeles Department of Water & Power.

The Team meets bi-monthly. Working committees have been established within each program area listed below and meet as necessary to accomplish the goals of the Policy.

- Energy and Water Efficiency Program
- Green Building Operations Program
- Environmental Stewardship Program
- Public Education & Outreach Program

SIGNIFICANT ACCOMPLISHMENTS AND ACTIVITIES

Significant Team accomplishments and activities are described below. A more detailed description of the programs and additional activities are included in Attachment 1. In addition, the Team has been providing support on Board directed reports on energy and environmental issues which are also listed in Attachment 1.

- ISD has developed an Environmentally Preferable Purchasing Policy which establishes objectives for County purchasing that support the Energy and Environmental Policy. The California State Association of Counties, in coordination

with ISD's Purchasing Division, is hosting a regional green purchasing seminar to be held on August 23, 2007.

- Public Works has expanded its existing County Departmental Recycling Program by purchasing 40,000 desk-side paper recycling bins and an initial set of beverage container recycling bins.

- A series of energy and environmental "fairs" are being scheduled to provide County employees with information on energy efficiency and sustainable products and practices for home and work. The "fairs" will be held periodically at campus-type settings throughout the County. The first fair is scheduled for September 27, 2007 in the mall between the Hall of Administration and the Mosk Courthouse. The Office of Small Business has integrated an energy and environmental program into their series of "Doing Business with the County" workshops.

- The County's proposed 2007-08 Capital Program reflects 53 projects that have been designated for the sustainable design program. Further, 20 of the projects will be certified at the LEED Silver level or higher.

- LEED Existing Building certification studies are being conducted at two County facilities (ISD Headquarters and the Public Works Headquarters Tower). These studies will assist in formulating a building best practices guide for operating and maintaining County facilities.

- The County has joined the California Climate Action Registry in order to utilize their reporting protocol for developing an assessment of the County's total greenhouse gases emissions responsibility. The Team is gathering information for reporting on the County's 2006 greenhouse gases emissions and developing an internal protocol for interdepartmental documentation of information needed for future reporting.

- ISD implemented energy efficiency projects have resulted in electricity savings of up to $13 million per year. The cumulative savings since 1994, when ISD initiated the program, is more than $90 million, while the costs of the projects have been approximately $30 million.

If you have any questions, please contact me or Howard Choy at (323) 881-3939.

DL:HWC:g

c: William T Fujioka
ISD Board Deputies
Each Department Head

ATTACHMENT 1
Key Activities and Accomplishments of Energy & Environmental Policy Team

This document provides information on the activities and accomplishments to date of the Energy and Environmental Policy Team (Team). The Team was created by the Board on January 16, 2007 when it adopted the Countywide Energy and Environmental Policy (Policy). The information in this report is presented under four main headings consistent with the Policy program areas:

- Energy & Water Efficiency,
- Green Building Operations,
- Environmental Stewardship,
- Public Education & Outreach.

ENERGY & WATER EFFICIENCY PROGRAM

Program Description

This program seeks to further reduce County facilities energy and water consumption through the establishment of specific reduction targets and formal reporting to measure progress towards these targets and to reduce energy consumption in County facilities by 20% by 2015. The program includes an initiative to enhance employee and organization education and awareness, implement conservation monitoring practices, and implement energy and water efficiency projects in County buildings.

Employee and Organizational Education

The Team is coordinating a series of energy and environmental "fairs" which will provide employees with exposure to energy efficient and sustainable products and practices for home and work. The "fairs" will feature energy and environmental industry experts, manufacturers, and product representatives who will provide information, handouts, and product samples related to:

- Utilities energy efficiency and renewables programs;
- Energy efficient products, appliances and heating/cooling systems for the home;
- Solar and distributed generation systems;
- Environmentally friendly products for home and office use;
- Public transit and hybrid vehicles;
- Green building and home certifiers;
- Other sustainable products and services.

The "fairs" will be held periodically at campus type settings throughout the County. The first "fair" is scheduled for September 27, 2007 in the mall between the Hall of Administration and the Mosk Courthouse.

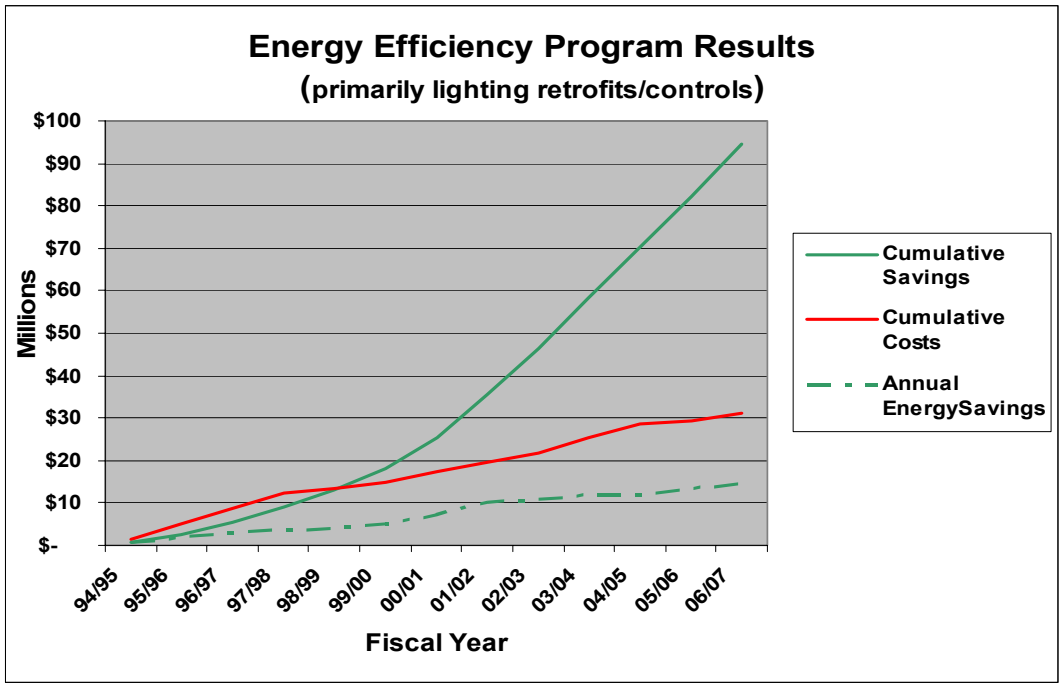
ATTACHMENT 1
Key Activities and Accomplishments of Energy & Environmental Policy Team

A County-wide email to all departments has been sent out urging conservation measures that can be implemented by all employees to help reduce regional energy demand this summer.

ISD has been conducting training classes for building management personnel throughout the County on the use of the Enterprise Energy Management Information System (EEMIS). EEMIS, among other things, allows building managers and other staff to track energy consumption and compare it against past periods' energy usage both in "real-time" and over longer periods of time. EEMIS is a critical tool that ISD will be using to monitor progress towards meeting the 20% energy reduction goal.

Conservation Monitoring Practices

ISD has implemented hundreds of energy efficiency projects since 1994-95. These projects include retrofitting lighting systems and other equipment, installing lighting system controls, and facility retrocommissioning. Retrocommissioning involves performing detailed "tune up" of a building's energy-using systems to insure they are operating in an optimal manner. These projects have resulted in electricity savings of up to $13 million per year. The cumulative savings since 1994 is more than $90 million, while the costs of the projects have been approximately $30 million. The annual and cumulative savings and costs of all energy efficiency projects implemented by ISD are shown in the graph below.



The energy consumption baseline from which progress towards achieving the 20% reduction goal by 2015 will be measured using electricity and natural gas consumption

from calendar years 2002 through 2004. Averaging over multiple years mitigates consumption variances due to unusually hot or mild seasons. This baseline is currently being developed within EEMIS to include natural gas and electricity for the entire County and for a subset of the County's largest energy consuming facilities where most of the energy efficiency projects have been implemented and the results have been closely monitored.

EEMIS allows County facility managers or energy management staff to observe "real-time" energy consumption via the internet. The immediate impacts of energy projects, operational changes, and behavioral changes like voluntary demand reduction can be observed through this functionality. Currently about 150 of the County's largest facilities are monitored by EEMIS. These facilities use more than 80% of the energy consumed by County buildings.

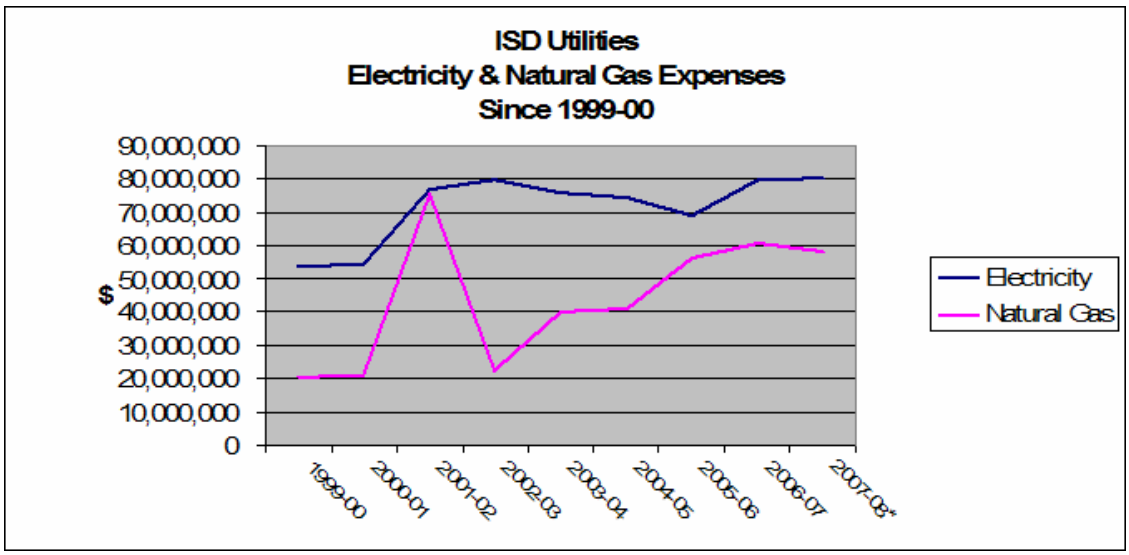
EEMIS monitoring is not implemented at all County facilities. To do so is cost prohibitive. For all facilities but in particular those that are not monitored directly by EEMIS, EEMIS is used to analyze consumption trends using utility bill information. The impacts of energy efficiency, retrocommissioning, and other projects over months and years can be monitored using this functionality. Currently Southern California Edison and the Gas Company provide billing information via electronic file transfers. ISD is working with the Los Angeles Department of Water & Power to receive bill information for County accounts in their service territory.

As directed under the Policy, the County has joined the California Climate Action Registry (Registry). Under the Registry's reporting protocols, the Team is developing an initial report that will represent the amount of greenhouse gases produced as a result of County operations. The Team will use documented energy savings converted to greenhouse gases avoidance as a key element of reporting the County's progress towards reducing its greenhouse gases emissions. More details on the Team's activities to develop a greenhouse gases report under the Registry are described later in this report under the Environmental Stewardship Program's description of activities.

Energy and Water Efficiency Projects

A representation of the annual ISD-managed Utilities Budget for FY 1999-00 to FY 2007-08 is depicted below. Despite rising costs, the electricity budget has remained relatively stable due to the savings generated by ongoing energy efficiency projects. The natural gas budget reflects the volatility in market prices for fuel purchases for the County's cogeneration power plants and other large facilities such as jails, hospitals, and probation camps. About one-third of the natural gas budget is used for the cogeneration power plants which don't represent significant opportunities for energy efficiency projects. The electricity budget and remaining natural gas budget still contain opportunities for efficiency savings especially considering the potential under retrocommissioning.

ATTACHMENT 1
Key Activities and Accomplishments of Energy & Environmental Policy Team



ISD started its facility retrocommissioning program in early 2005 and by the end of that year had retrocommissioned 13 County facilities. The results, based on actual reductions observed in utility bills, are indicated below. Facility retrocommissioning represents ISD's first focused effort at reducing natural gas consumption in County facilities. As can be seen below, the natural gas savings potential in County facilities is significant.

13 Facilities Retrocommissioning Cost:	$1.3 million
Total Annual Retrocommissioning Savings:	$ 0.4 million
Average Facility Electricity Savings:	20%
Average Facility Natural Gas Savings:	40%

The Team is working with the departments responsible for most of the County's building maintenance (ISD, Sheriff, Health Services and Public Works) to identify and prioritize deferred maintenance projects with the greatest potential energy savings. Deferred Maintenance refers to the backlog of maintenance and repair projects that have been deferred to future budgets. Deferring maintenance often results in increased maintenance and energy costs. Using a combination of County funding, state grants, utility incentives and financing, the Team will develop a program designed to provide incentives to implement deferred maintenance projects which save energy costs. This effort supports the Board motion dated June 18, 2007 directing ISD to make energy efficiency a criterion for prioritizing deferred maintenance projects.

Funding for retrocommissioning and other energy efficiency projects is critical to developing energy savings. ISD has received $13 million since 2002 in grants from the California Public Utilities commission (CPUC) from their energy efficiency programs including $6 million for calendar years 2006-08. ISD and its utility company partners will

be submitting a proposal for the CPUC's 2009-11 energy efficiency program. Also, ISD's budget for FY 2006-07 and FY 2007-08 includes $5 million each fiscal year for energy efficiency projects.

Water Efficiency

The Team met with Public Work's Office of Reclaimed Water to begin prioritizing County sites for reclaimed water use. The Team will continue to participate in that Office's regular, program development meetings. Other water efficiency technologies for existing County facilities are being examined and evaluated under two Leadership in Energy and Environmental Design (LEED) Existing Building feasibility studies that are described later in the report under the Green Building Operations Program.

ISD is installing waterless urinals in its Administrative Headquarters this fiscal year and will document water savings versus maintenance costs and develop recommendations related to expansion of this technology.

GREEN BUILDING OPERATIONS PROGRAM

Program Description

The Policy directed the CEO and Public Works to develop a sustainable design program for the County's Capital Construction Program and promote sustainable County operations practices. On January 16, 2007 the Board directed that the Capital Construction Program achieve LEED Silver Certification for new buildings greater than 10,000 square feet. The Policy instructed the Team to provide support to this effort in the form of technical expertise in building operations and maintenance, environmental programs, and in energy and water efficiency.

New Construction – LEED Silver Certification Technical Support

The County's proposed 2007-08 Capital Program reflects 53 projects that have been designated for the sustainable design program. Further, 20 of the projects will be certified at the LEED Silver level or higher. LEED certification for new buildings requires that building systems be rigorously commissioned to ensure they are operating properly and efficiently when construction and testing are completed. Commissioning a building's heating, ventilating and air conditioning (HVAC) systems establishes the benchmark against which the system's energy performance will be measured in future years to determine if the building is in need of retrocommissioning and ensure long term energy savings.

ISD is working with the CEO and Public Works to utilize ISD's retrocommissioning experience in the commissioning of new buildings. ISD's retrocommissioning projects have been partially funded by the CPUC and, as a result, those retrocommissioning

standards and procedures have been reviewed and approved by our utility companies and by 3rd party auditors.

In addition, ISD is working with the CEO and Public Works to implement EEMIS monitoring in new building construction. Using EEMIS to store building system's commissioning information ensures that energy performance can be benchmarked and continuously evaluated.

Utility companies now offer incentives for energy efficiency designs in new buildings and major renovation projects. These funds are available during the design and procurement phases of projects and can offset the higher cost of more efficient equipment. The Team will work with the CEO and Public Works to facilitate the application and receipt of these incentives.

Existing Facilities - LEED Existing Building (EB) Studies

The Team is exploring a comprehensive and consistent methodology for implementing energy efficient and sustainable practices into existing County building operations through LEED EB certification. LEED EB differs from LEED NC (new construction) in that certification points are achieved primarily from existing building/site operating and maintenance practices. LEED EB categories include: site sustainability, water and energy efficiency, indoor air quality, source waste reduction and waste diversion, and sustainable operations and maintenance. These categories encompass green purchasing, recycling, landscape and building operations and maintenance practices, and comprehensive energy management.

Two studies are underway to determine the feasibility of achieving LEED EB certification. The two sites being examined are the Public Works Headquarters Tower building and the ISD Administrative Headquarters. Their age and size is representative of most medium and large County office buildings. The studies will be completed over the next 6 months.

County Facility Operating and Maintenance Best Practices

Using information from the LEED EB studies above and case studies of other facilities with LEED EB or equivalent certifications, ISD will develop a manual of recommended best practices for facilities for which ISD is responsible for operations and maintenance. The manual will serve as a guide to determine general scope of work necessary to attain LEED EB certification for County facilities.

Environmentally Preferable Purchasing

The Countywide Energy and Environmental Policy states that the Policy Team will investigate requirements and preferences for environmentally friendly packaging, place

greater emphasis on recycled products, and maximize energy efficiency as part of the development of an environmentally responsible purchasing standard. On June 14, 2007 ISD's Purchasing Division released County Purchasing Policy P-1050, "Purchase of Environmentally Preferable Products" which establishes objectives for County purchases that:

- Conserve natural resources;
- Minimize environmental impacts such as pollution and use of water and energy;
- Eliminate or reduce toxics that create hazards to workers and our community;
- Support strong recycling markets;
- Reduce materials that are put into landfills;
- Increase the use and availability of environmentally preferable products that protect the environment;
- Encourage manufacturers and vendors to reduce environmental impacts in their production and distribution systems; and
- Create a model for successfully purchasing environmentally preferable products that encourages other purchasers to adopt similar goals.

Under the purchasing policy, ISD's Purchasing Division will determine appropriate standards for green purchasing and will develop a 5-year plan to phase-in categories of certified goods. Easy to adopt purchasing categories (e.g., paper, cleaning supplies) will be implemented as soon as possible. Central purchasing agreements with a catalog of environmentally friendly and energy efficient products will be established and existing agreement databases will be modified for easy identification of green products. ISD's Purchasing Division is retaining a consulting firm to help develop environmentally preferable purchasing specifications.

The California State Association of Counties, in coordination with ISD's Purchasing Division, is hosting a regional green purchasing seminar to be held on August 23, 2007 at Public Works' Event & Training Room B beginning at 1:00pm. The event will feature nationally recognized experts sharing knowledge on local government green purchasing best practices and tools necessary to implement and achieve green purchasing goals.

Other Green Building Activities

As part of the motion approving the Policy, the Board requested a report from Regional Planning and Public Works on the opportunities to incorporate LEED standards or similar requirements into the County's development standards for all appropriate industrial, commercial and residential development within the unincorporated areas. The Team is providing technical assistance in developing the report.

Regional Planning and Public Works will be reporting back to the Board on August 31, 2007.

ATTACHMENT 1
Key Activities and Accomplishments of Energy & Environmental Policy Team

ENVIRONMENTAL STEWARDSHIP PROGRAM

Program Description

The purpose of this program is to measure and reduce the County's "environmental footprint" including the amount of greenhouse gases produced through direct and indirect County operations. Also under this program, the Team works to enhance County environmental policies and programs that are already implemented.

Environmental Footprint – Greenhouse Gases Reporting

As mentioned earlier, the County has joined the California Climate Action Registry (Registry) to utilize their reporting protocol and adapt it for use as a County protocol for determining the County's total greenhouse gases emissions responsibility. This reporting encompasses specific measurements of the following operations in order to comprehensively quantify greenhouse gases emissions responsibility:

- Electricity and natural gas purchased from utilities,
- Electricity produced by County operations,
- Liquid fuels and natural gas consumed by stationary sources (e.g., boilers, standby generators),
- Liquid fuels and natural gas consumed by mobile sources (e.g., cars, trucks and miscellaneous construction and maintenance equipment),
- Refrigerants consumed in County facilities and vehicles (primarily air conditioning equipment).

ISD is acquiring County-wide utility consumption information and electricity production information and is working with large departments to determine quantities of fuels and refrigerants consumed. The Team is also working to determine the responsibility the County has for reporting greenhouse gases emissions involving operating leases, capital leases, and other financial or operational agreements that are directly and indirectly responsible for producing greenhouse gases emissions.

Development of a County protocol for determining the County's total greenhouse gases emissions responsibility that utilizes centrally maintained information and a standard reporting process for all departments is consistent with the Board's Policy and:

- Could be required to report greenhouse gases emissions responsibility (and reductions through its energy and environmental programs) under regulations currently being developed at State agencies,

- Allow the County to participate in future greenhouse gases trading markets either to comply with regulations or to get credit for its program reductions.

An initial report under Registry protocol and an independent audit of that report, for 2006 greenhouse gases emissions, will be completed by the end of this calendar year.

Climate Change Regulatory and Legislative Activity

AB 32 was signed into law in 2006 and requires the State to lower greenhouse gases emissions by 2020 to 1990 levels. Regulations that determine which entities (e.g. counties) that will be required to report greenhouse gases responsibility, how 1990 baseline levels will be determined, how greenhouse gases reductions will be measured and credited, the role of local governments in enforcement, and a host of other issues are being determined at various State agencies. This was described in a memorandum sent to your Board dated February 26, 2007.

Additionally, dozens of proposed bills to modify or enhance AB 32 are under consideration at the State legislature. ISD is tracking this regulatory and legislative activity. An AB 32 update briefing for interested County parties is being scheduled for August 2007. A separate, update report on the status of AB 32 implementation activities will be sent to your Board after the briefing.

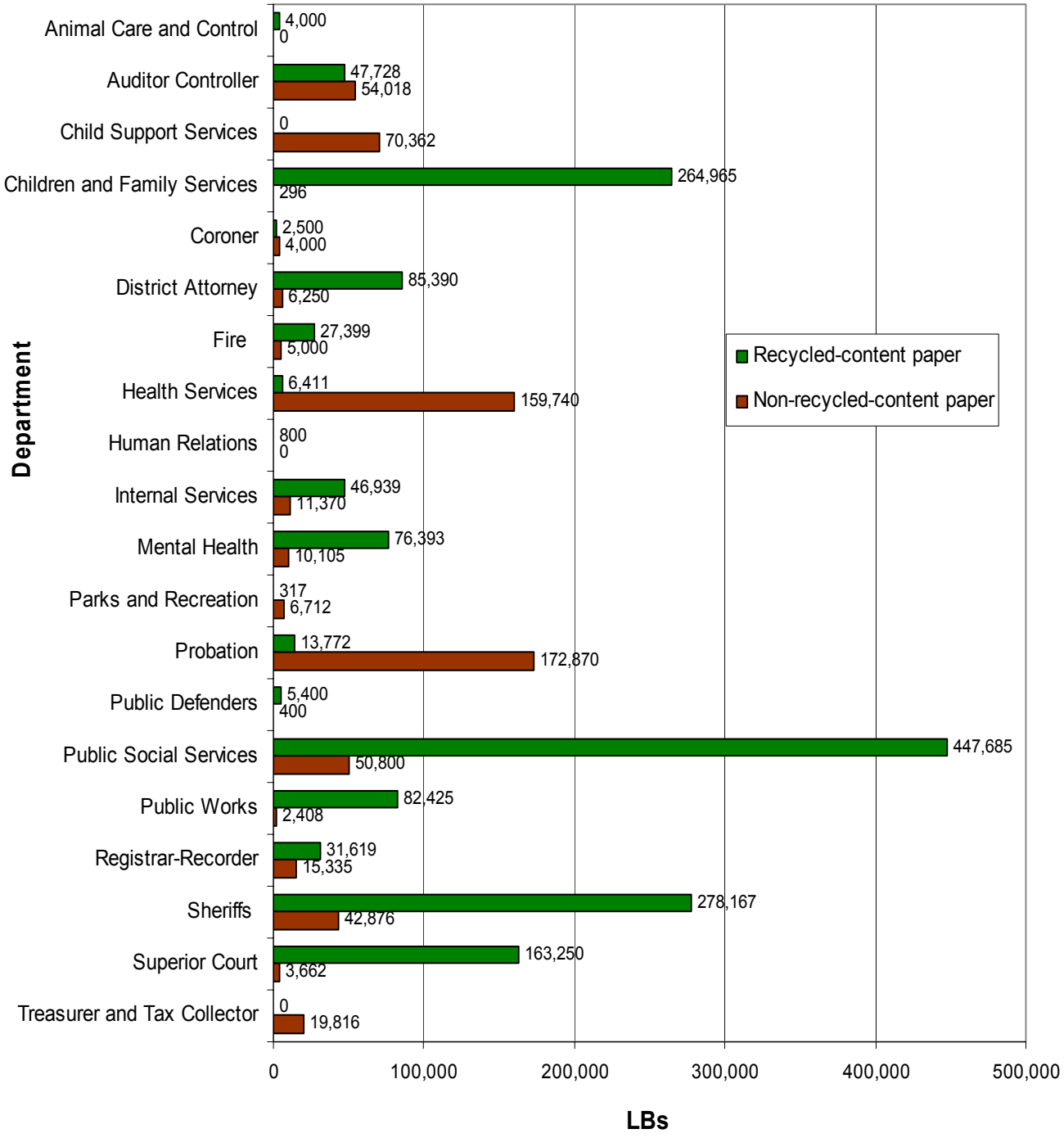
Departmental Recycling

The Team is working to enhance the County Departmental Recycling Program which is led by Public Works' Environmental Programs Division. The Policy placed a priority on implementing recycling bins in visible areas for the segregation of paper, plastic, glass and other recyclables from normal waste.

To enhance paper recycling through the purchase of recycled-content paper, Public Works currently monitors the amount of recycled-content (RC) versus non-recycled (non-RC) paper purchased through the Countywide vendor by various departments. The chart below illustrates the amount of RC versus non-RC paper that was purchased by participating departments during the first quarter of 2007. Current County policy allows a 10 percent price preference when purchasing RC paper over non-RC paper. According to Public Works, the quality of RC paper is comparable to non-RC paper while the RC price difference compared to non-RC paper is about 5 percent higher based on current rates provided by the vendor. Public Works will work with ISD to make RC paper mandatory for all County departments. Mandatory RC paper procurement would not have a significant economic impact and will substantially enhance departmental recycling efforts.

ATTACHMENT 1
Key Activities and Accomplishments of Energy & Environmental Policy Team

POUNDS OF RECYCLED-CONTENT VS. NON RECYCLED-CONTENT PAPER
Purchased from County-side Vendor during First Quarter of 2007



ATTACHMENT 1
Key Activities and Accomplishments of Energy & Environmental Policy Team

Public Works has purchased 40,000 desk-side paper recycling bins for distribution to County employees in buildings that are enrolled in the existing paper recycling program. The desk-side bins emphasize individual recycling and segregation of white paper from other recyclable paper. These bins are currently being distributed at the Hall of Administration, ISD Headquarters and Public Works Headquarters. Also, Public Works is purchasing outdoor beverage container recycling bins. The bins will be installed at the Hall of Administration, Registrar-Recorder's Norwalk Office, Stanley Mosk Courthouse, Downey Courthouse and Norwalk Courthouse this summer.

Other Board Motioned Environmental Activity

The Board has requested reports on various energy and environmental initiatives which are related to the work of the Policy Team. The Team is currently participating in committees and assisting departments in responding to these motions as indicated below:

TOPIC	ASSIGNED TO	MOTION DATE	DUE DATE/STATUS
Study on requiring LEED or equivalent standard on all development in unincorporated areas.	Regional Planning, DPW	1/16/07	Originally due 7/17; a 45 day extension was requested to 8/31.
Study on incorporating Low Impact Design standards (LIDS) for new development projects.	Regional Planning, DPW	1/16/07	Originally due 7/17; a 45 day extension was requested to 8/31.
Study on proposed incentives for employee purchased hybrids and increased mass transit use	CEO, DPW, ISD	3/13/07	Status memo sent to BOS on 6/7 requesting an extension.
Investigation into banning plastic bags similar to the ban in San Francisco	CEO led ad-hoc committee	4/10/07	Status memo sent to Board on 7/12 requesting 45-day extension. Board letter with findings and recommendations targeted for 8/21 agenda.
Study on the impacts of banning Styrofoam food containers throughout the County	DPW, ISD	5/22/07	Response due 8/20.
Incorporate energy efficiency as a criteria for prioritizing deferred maintenance	ISD	6/18/07	Energy efficiency criteria will be incorporated in the prioritized listing of deferred maintenance projects published 9/30

PUBLIC EDUCATION AND OUTREACH PROGRAM

Program Description

The purpose of this program is to utilize the County's communication and outreach channels to share utility industry information, facilitate implementation of subsidy and assistance programs, and spread energy conservation practices throughout the region.

Regional Outreach

The County employee energy and environmental fairs described earlier, though held at County venues and marketed towards County employees will be open to the public as well.

The Team presented an overview of the Energy and Environmental Policy and an update on AB 32 at a Doing Business with the County Workshop conducted by the Office of Small Business. This workshop was held on 3/1/07 in El Segundo. The Office of Small Business has indicated they will integrate an energy and environmental program into future workshops agendas. The Team is working with the Small Business Commission on promoting greater energy efficiency and environmental stewardship awareness for small businesses.

Low Income Activities

The Community Development Commission/Public Housing Authority (CDC/PHA) has met with utility companies to discuss increasing the enrollment of more public housing tenants onto low-income subsidy programs. This is a stated priority of the CPUC. One identified barrier is tenant education and facilitation of the application process. The utility companies and CDC/PHA are scheduling a series of presentations at low-income facilities to describe these programs and the application process and help enroll qualified tenants. CDC/PHA will also assist tenants in these areas as part of their operations.

CDC/PHA and the utilities are exploring another opportunity to enroll more low-income tenants on these programs. It was discovered that nearly all of the CDC/PHA tenants at the Nueva Maravilla facility qualify for the California Alternative Rates for Energy (CARE) program administered by the utilities; however, they cannot be enrolled onto this program because the facility is on a single, utility meter (master-metered). CARE provides a 20% monthly discount on bills but not for master-metered tenants. CDC/PHA, through Southern California Edison, provided testimony at a CPUC Low Income Oversight Board hearing in June of this year requesting modification of either the utilities program administration or the Commission's program regulations. CDC/PHA, the utilities and the Team are also investigating the resources that may be needed to resolve this issue through legislation. The Team will involve other utilities

and public housing authorities to investigate proposed legislation that would eliminate the master-metered disqualification for CARE programs and increase enrollment of otherwise qualified, public housing tenants onto low-income programs throughout the State.

As a result of participating on the Policy Team, the CDC/PHA is developing an energy strategy for their existing facilities and construction program.

Local Government Collaboration

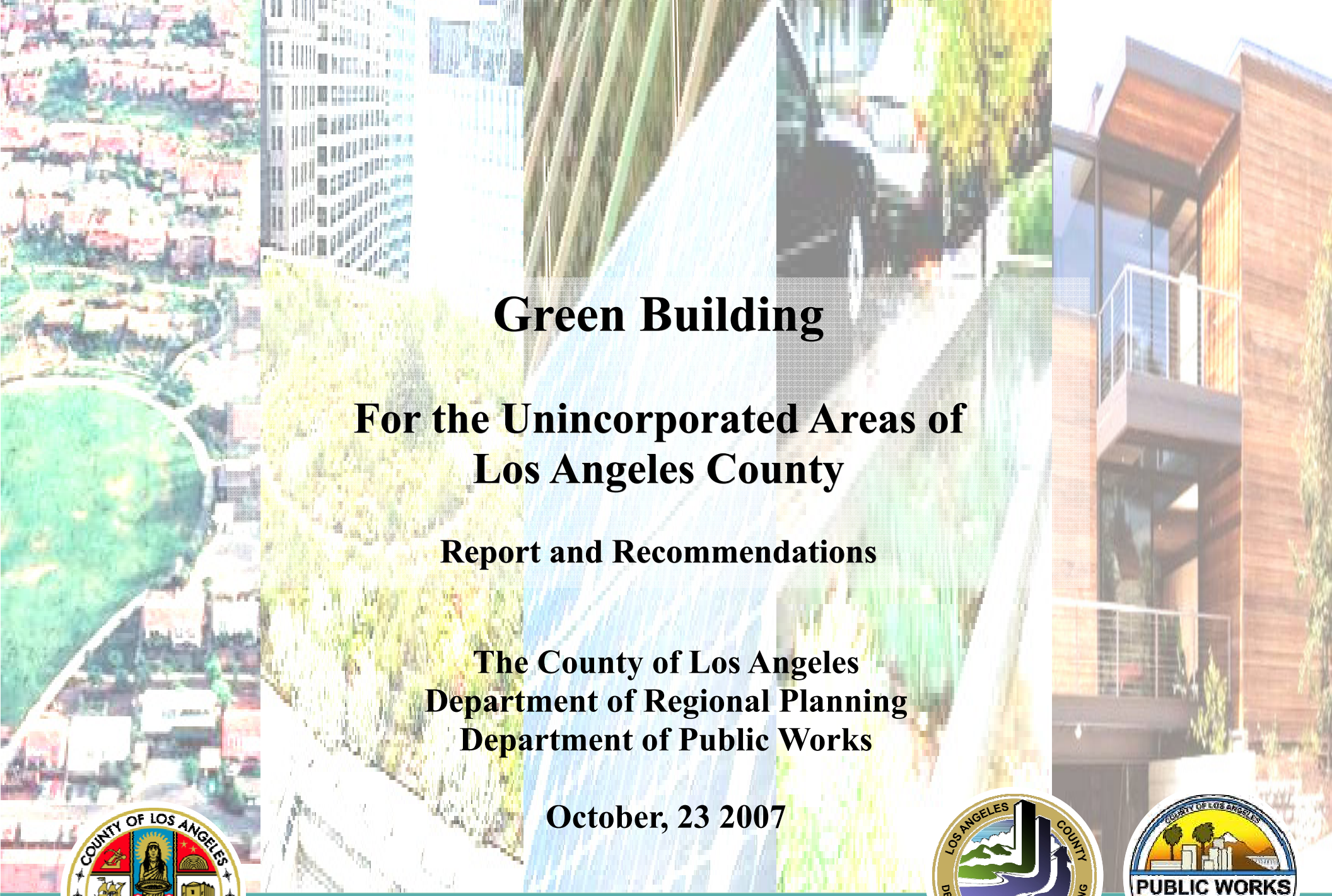
The County, through ISD, has joined the Local Government Commission Sustainable Energy Coalition (LGSEC). The LGSEC is a membership of local governments who have committed to tracking and participating in energy activities jointly in order to conserve expenses and speak with a stronger, unified voice.

The LGSEC has been active in submitting comments to the CPUC describing the unique value of local governments in promoting and implementing energy efficiency. Many local governments (mostly in the South Bay area) have energy management programs that serve not only their own municipal infrastructure and operations but business and residential constituents as well. LGSEC comments at these proceedings have sought an expanded role for local governments and expanded programs which utilize local governments' unique collaborative and outreach resources.

ISD led a study in 2005, funded by a CPUC grant, which investigated how local governments and public agencies in the region could promote energy efficiency. That study concluded that lack of industry expertise, leadership and resources were preventing energy efficiency projects from being implemented. ISD has proposed to the CPUC that its current grant be expanded to investigate how the County can play a role in centrally promoting and administering efforts to implement energy efficiency projects at County-affiliated agencies (e.g., MTA, County Office of Education, Small Business Commission, Sanitation Districts, etc.) and other, smaller local governments. The County will also include a proposal under the CPUC's 2009-11 energy efficiency partnership programs to do the same.

ATTACHMENT D

Green Building for the Unincorporated Areas of Los Angeles County



Green Building

For the Unincorporated Areas of Los Angeles County

Report and Recommendations

The County of Los Angeles
Department of Regional Planning
Department of Public Works

October, 23 2007

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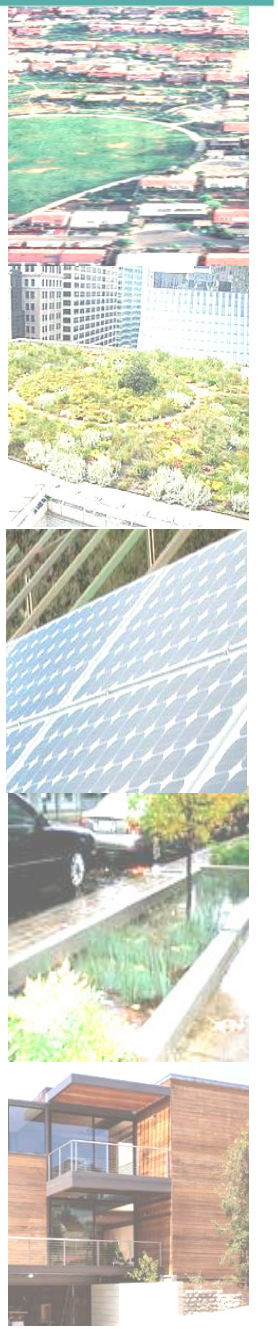


I. SUMMARY AND RECOMMENDATIONS

The Los Angeles County Board of Supervisors is committed to a more sustainable and greener County. On January 16, 2007, the Board took action requiring all new County buildings larger than 10,000 square feet to achieve LEED Silver or higher and use only drought tolerant landscaping.

On January 16, 2007, the Los Angeles County Board of Supervisors instructed the Directors of Public Works and Planning to investigate and report back on opportunities to incorporate LEED standards or similar requirements into the County's development standards for all appropriate industrial, commercial and residential development within unincorporated areas and develop a recommended implementation program, including changes to building and zoning codes, that will allow for measurable improvements to energy efficiency, third-party verification of results, and ongoing flexibility to easily incorporate new standards of green building design as they are developed by the United States Green Building Council (USGBC), or other accreditation organizations.

The Board directive clearly recognizes that building design and construction have a tremendous impact on the health of the environment and the people that inhabit them. The Board's action on this matter reflects the growing understanding of how the built environment is effecting carbon dioxide (CO_2) emissions and ultimately contributing to global warming. According to the USGBC, the energy used to heat, cool and light buildings, as well as the energy used in their construction, generates more greenhouse emissions than either transportation or industry. In fact, it has been proven that the building sector is the single largest source of CO_2 emissions in the United States. Depending on the estimates, buildings contribute anywhere from more than a third to nearly half of all greenhouse gas emissions in the U.S. Green buildings, however, use 20-50% less energy and reduce CO_2 emissions by 40% as compared to conventionally designed buildings.

A green building is defined as a building that is sited, designed, constructed and operated to enhance the well-being of occupants, and to minimize negative impacts on the community and natural environment. Green buildings achieve this by being energy and water efficient, minimizing waste, providing better indoor air quality and using more responsible building materials.

AB32 requires that all jurisdictions within the state to reduce their carbon footprint to 1990 levels by 2020.

The County has already shown a commitment to incorporating green building measures and will continue to:

1. Work with consultants on the General Plan Update and Zoning Ordinance Update to incorporate green building concepts.
2. Direct all applicants submitting Environmental Impact Reports under the California Environmental Quality Act to discuss AB32 and climate change issues within the document and to discuss the implementation of proposed Green Building standards as mitigation measures.
3. Condition the incorporation of Green Building practices for certain projects.
4. Require a minimum 70% open space within non-urban hillside management areas of the County.
5. Require planting of on-site trees within proposed subdivisions.
6. Require commercial parking lots to have a minimum 2% landscaped area.
7. Encourage clustered development within proposed subdivisions.
8. Encourage Transit Oriented Development through the granting of density bonuses.


Los Angeles County General Plan Update Program

December 2000

Shaping the Future 2025

Prepared by the Department of Regional Planning

The Purpose of the Los Angeles County General Plan

The General Plan is a unified statement of policy concerning the long-term development of the County

Plan Implementation

Plan Consistency Determination

9. Require the use of native, drought tolerant landscaping and fire-resistant construction of buildings in Very High Fire Hazard Severity Zones.
10. Require recycling of 50% of construction material and demolition debris for all non-residential and multi-family residential projects.
11. Require the design, installation and maintenance of water-efficient landscapes in excess of 2,500 square feet for all non-residential and multi-family residential projects.
12. Require the compliance with Statewide Energy Efficiency Standards (Title 24, Part 6).

Recycled Water in the Arthur J. Will Fountain
Civic Center Mall, Los Angeles

The proposed recommendations summarized in Table 1 and Table 2 are the result of collaboration between the Department of Regional Planning and the Department of Public Works. In developing these recommendations, the Departments reviewed existing County Code, conducted surveys of other jurisdictions, and reviewed published third party green building standards, guidelines, and rating systems. The resulting recommendations in Table 1 will apply to all commercial buildings over 10,000 square feet, major remodels over 25,000 square feet and new residential construction projects. The implementation of these recommendations will foster the County's commitment to sustainable building practices and the quality of life for our constituents. Table 2 includes further recommendations for incorporating green building measures that would apply to specific projects as identified within the table, as well as steps necessary to fully implement the Green Building Program.

TABLE 1.

RECOMMENDATIONS FOR GREEN BUILDING STANDARDS
COMMERCIAL AND RESIDENTIAL CONSTRUCTION

		2008	2009	2010	2011
1	Large Commercial / Mixed Use / Hotel ≥ 25,000 Square Feet (New/Additions/Remodels w/ MEP Work)	**LEED Checklist**	**LEED - Certified**	**LEED - Silver**	**LEED - Silver**
2	Mid-Size Commercial / Mixed Use / Hotel ≥ 10,000 to 25,000 Square Feet (New/ Additions)	**Voluntary**	**LEED Checklist**	**LEED Checklist**	**LEED Checklist**
3	New High Rise > 75 Feet Height	**LEED Checklist**	**LEED - Silver**	**LEED - Silver**	**LEED - Silver**
4	New Residential	**Voluntary**	**Voluntary**	**GPR**	**GPR**

MEP: Mechanical, Electrical, Plumbing

LEED: Leadership in Energy and Environmental Design is a rating system established by the *United States Green Building Council (USGBC)* as an independent means to verify the sustainable qualities of different building types.

GPR: GreenPointRated is a residential green building rating system administered by the non-profit organization *Build It Green (BIG).*

Whenever LEED or GPR are used, any other appropriate guideline, rating system or standard that is recognized and approved by the County may be used to meet the requirement.

TABLE 2.

COUNTY OF LOS ANGELES
DEPARTMENTS OF REGIONAL PLANNING AND PUBLIC WORKS

GREEN BUILDING PROGRAM
RECOMMENDATIONS AND REQUESTS TO THE BOARD OF SUPERVISORS

1	**January 2008**	Implement green building performance recommendations for privately constructed buildings as indicated in Table 1. Compliance in 2008 is voluntary in order to allow the building community to become familiar with green building requirements.
2	**April 2008**	DRP to amend Title 22, Planning and Zoning Code, to require planting of new shade trees for all single lot residential development, increase the number of trees required in parking lots, including rooftop parking areas.
3	**January 2008**	CEO to create a new County of Los Angeles "Green Building Advisory Committee" to include affected County Departments and private stake holders to focus on future opportunities to improve the performance of private sector commercial and residential buildings and recommend new Green Building requirements and process improvements.
4	**January 2008**	DRP and County Counsel to develop Green Building conditions that may be applied to discretionary projects.
5	**Concurrent with the General Plan Update Adoption**	DRP and County Counsel to include AB32 Greenhouse Gas Emission Reduction mandates in the County's General Plan Revision.
6	**December 2008**	DPW to amend Title 20, County Utilities Code, Construction and Demolition Debris Recycling and Reuse requirements, to include single lot residential development.

TABLE 2., CONTINUED

COUNTY OF LOS ANGELES
DEPARTMENTS OF REGIONAL PLANNING AND PUBLIC WORKS

GREEN BUILDING PROGRAM
RECOMMENDATIONS AND REQUESTS TO THE BOARD OF SUPERVISORS

7	**July 2008**	DPW to revise Title 26, Building Code, Water Efficient Landscaping, to include County facilities. Adopt revised "Water Efficient Landscaping" provisions as developed by the State of California Department of Water Resources. DRP to revise Title 22, Planning and Zoning Code, to include drought tolerant landscaping.
8	**July 2008**	CEO to provide funding for DRP and DPW to dedicate staff to promote Green Building construction, answer public inquiries, develop educational materials and coordinate with other agencies to create and publish incentives to encourage Green Building.
9	**July 2008**	CEO to provide funding for DRP and DPW staff dedicated to the review of applications, plans and inspections of proposed Green Buildings.
10	**July 2008**	CEO to provide funding to DRP and DPW for training staff on Green Building principles, and third party rating systems, guidelines and standards, and participation in future Green Building code development.
11	**July 2008**	CEO to provide funding to DRP and DPW to implement an automated system to track Green Building activity.
12	**July 2008**	DRP and DPW to develop a website explaining Green Building benefits, construction techniques, incentives and requirements.
13	**July 2008**	DRP and DPW to investigate raising application and permit fees to recover the costs associated with Green Building review.

II. GREEN BUILDING

Green buildings use 20-50% less energy and reduce CO2 emissions by 40% as compared to conventionally designed buildings.

Green buildings are sited, designed, constructed and operated to enhance the well-being of occupants, and to minimize negative impacts on the community and natural environment. Green buildings provide a healthier and more comfortable environment, improve long-term economic performance, incorporate energy and water efficient technologies, use recycled materials in their construction, reduce construction and demolition waste, are landscaped for water and energy efficiency, include renewable energy technologies, improve indoor air quality, reduce environmental impact, may be easier to maintain, and are built to last longer than most conventionally-designed buildings.

Green buildings have improved energy and water efficiency, produce less waste, provide better indoor air quality and use more responsible building materials. The design of a green building achieves this through some of the following design features:

- Energy Efficiency
  - ◊ Quality construction
  - ◊ High-performance building materials
  - ◊ Efficient lighting design
  - ◊ Energy efficient appliances and equipment
  - ◊ Alternative energy use
- Water Efficiency
  - ◊ Drought tolerant landscaping
  - ◊ Minimal turf areas
  - ◊ Efficient irrigation systems

Daylighting in the Library,
Whitman-Hanson Regional High School, MA

- ◊ Water efficient appliances
- ◊ Efficient plumbing fixtures

- Waste Reduction
  - ◊ Construction and demolition debris recycling and reuse of materials
  - ◊ Efficient building design
- Indoor Air Quality
  - ◊ Low Volatile Organic Compounds (VOC) paints/ finishes
  - ◊ Outdoor air ventilation
- Building Materials
  - ◊ Recycled aggregate
  - ◊ Incorporation of flyash into concrete
  - Engineered lumber

LEED Platinum Home
Santa Monica, CA

There is growing evidence that mortgage lenders are willing to take utility savings into account when calculating loan limits.

The benefits of constructing green buildings rather than conventionally-designed ones have not only proven to have significant benefits to the environment, but have also proven to have tremendous social and economic impacts. According to "Greening America's Schools: Costs and Benefits 2006", by Gregory Kats, with only an average of a 2-3% increase in cost, green schools have proven healthier for children, with drastic reductions in cases of asthma, they allow children to learn better and retain more information, and there is better retention of school faculty as they have better working conditions and are more effective. Building green office buildings rather than conventional ones save a tremendous amount of materials. In an average conventionally-designed office building, the average worker consumes a quarter ton of materials and computers exhaust 1.3 billion tons

Solar Energy
Conversion System
Los Angeles

Daylighting at Clackamas High School, OR

of CO2 yearly, according to a June 2007 Times Magazine article. Not only do green office buildings greatly reduce these numbers, but workers want to work in them. According to staffing firm Adecco USA, one-third of workers would be more inclined to work for a green company, and more than half wish their employers would be more environmentally friendly.

One-third of workers would be more inclined to work for a green company, and more than half wish their employers would be more environmentally friendly.

And finally, the benefits of living in a green home are simple. A green home is safer, healthier, more comfortable, and more durable than conventional homes. The benefits include economic benefits such as lower energy and water bills; environmental benefits like reduced greenhouse gas emissions; and health benefits such as reduced exposure to mold, mildew and other indoor toxins. Further, there is evidence that mortgage lenders are willing to take utility savings into account when calculating loan limits.

Permeable Paving

Green building has further implications in the real estate market. Green Builder Media and Imre Communications recently reported that home buyers say they are willing to pay a premium of 11% to 25% for green-built homes, and that a home designed to reduce energy costs increases the homes value on the market. In fact, homes in a current LEED-certified planned development are selling at a 4 to 1 ratio to conventionally-designed homes. The U.S. Green Building Council has estimated cost increases from conventional development for different levels of LEED certification; from 0-2% for LEED certified buildings, 2-3% for LEED Silver buildings,

and 3-5% for LEED Gold buildings. These costs will reduce as builders become more familiar with new techniques and products become more readily available.

Transit Oriented Development

III. METHODOLGY

Staff has taken several steps in preparing the recommendations for a green building program, including analysis of the existing County Code, a cross-jurisdictional survey of green building programs, review of existing third-party standards, guidelines and rating systems, and stakeholder outreach.

Wind Energy Conversion System Lake Palmdale

A. Analysis of Existing County Code

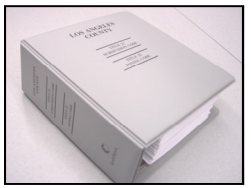
Staff has analyzed the County Code to identify standards already required that support green building**,** gaps within those standards, and barriers within the code and the administrative process that may prevent the implementation of green building measures. There are already requirements within the County Code that qualify as green building measures, and would receive points on third-party green building rating systems; however, there are also others that would be considered as obstacles. Staff recommends studying opportunities for broadening green building measures and eliminating current obstacles.

Mixed Use Development

TABLE 3. COUNTY CODE AND CURRENT GREEN BUILDING MEASURES

County Code	Standard
Title 22, Planning and Zoning Code, 22.56.205 Density-controlled Development	This provision allows for clustered development on a lot or parcel of land, so that the remaining portion of that lot or parcel may be maintained and protected as permanent open space.
Title 21, Subdivisions Code, 21.32.195 Requirement of planting on-site trees	This provision requires the developer to plant one tree within the front yard of each parcel resulting from a residential division of land. This provision applies only to residential subdivisions and does not currently apply to single lot residential development.
Title 26, Building Code, Chapter 71 Water Efficient Landscaping Ordinance	This provision sets forth regulations for designing, installing and maintaining water-efficient landscapes in new projects and for water management practices and water waste prevention for established landscapes. This provision does not currently require permits for landscaping of County projects and for single lot residential development and other landscaping < 2,500 sq. ft.
Title 20, Utilities Code, Chapter 20.87 Construction and Demolition Debris Recycling and Reuse Ordinance	This ordinance requires certain projects to recycle or reuse 50 percent of the debris generated. Fifty percent of all materials from demolition projects are required to be recycled. This provision does not currently apply to single lot residential development.

Staff is challenged to ensure that innovative technologies proposed by designers and developers are not discouraged due to increased project review and approval times. In addition, gaps within the Code that do not address emerging technology must be closed by continuing to work with our partners in code development at the local, state and national levels. The process of removing obstacles in codes and policies will eventually involve ordinance and zoning amendments, as well as training and educating staff on green building measures, new technologies, and how they should be reviewed. But as guardians of public safety, the County has the responsibility to ensure that green materials and methods undergo the same scrutiny that other code-approved



Title 21 and Title 22 of the County Code

materials and methods have endured. Permit applicants must be willing to do the legwork required to provide County staff with enough information to approve new technology/practices with confidence.

Solar Energy Conversion System

B. Review of Established Third-Party Green Building Systems

Staff has reviewed various third-party green building standards, guidelines and rating systems. These include Leadership in Energy and Environmental Design (LEED), GreenPoint Rated, California Green Builder, and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 189P. Most programs address similar components: energy, water, waste, indoor air quality and materials. The differences lie in the criteria, the rigor, the process for certification and the types of development it addresses.

Leadership in Energy and Environmental Design (LEED). The LEED Green Building Rating System was developed by the US Green Building Council as a national consensus standard for green building and serves as a benchmark for green development. The system is targeted to the 25% of top-performing buildings. LEED is the only system being reviewed that addresses all types of new construction, including commercial, industrial, retail, schools, health care facilities, and homes. LEED for Neighborhood Development (LEED-ND) is being developed for subdivisions and planned communities. The LEED-ND Rating System integrates the principles of smart growth, urbanism, and green building, and provides independent, third-party verification that a development's location and design meet accepted high standards for environmentally responsible, sustainable, development. LEED-

ND is currently at the beginning stages of its pilot program, and is due to be launched in 2009.

The LEED system provides a menu of items for the builder to choose from. A project may earn certification from the USGBC if it meets certain prerequisites and performance benchmarks credits within each category: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality.

Boulder Community Foothills Hospital, CO
First and Only LEED-Certified Hospital in the US

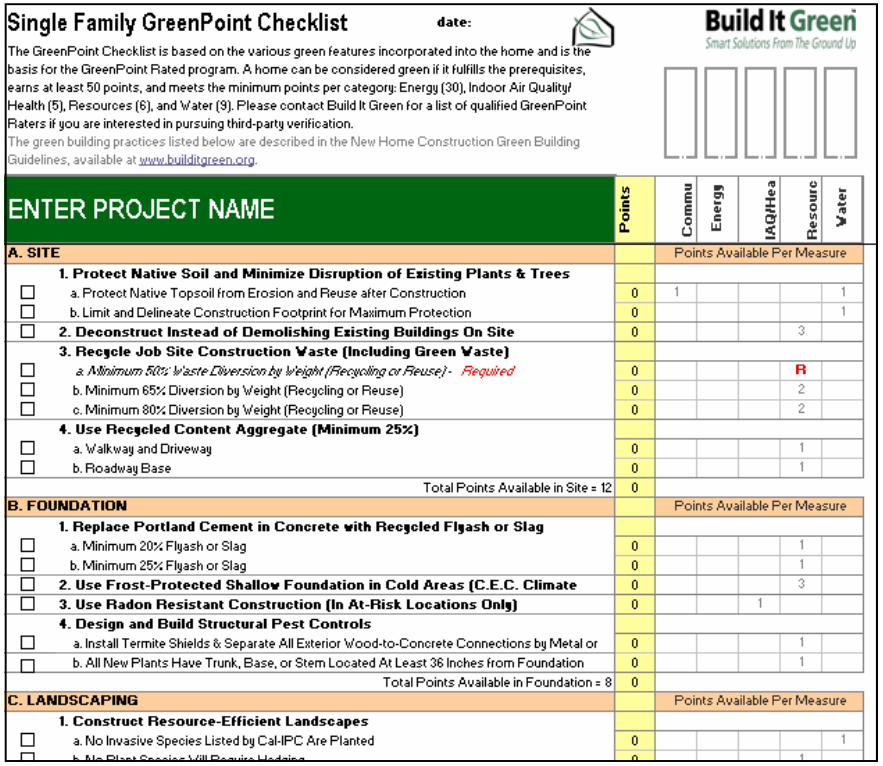
LEED is the national consensus standard for green building and serves as a benchmark for green development.

Projects are rated by a third party and are awarded Certified, Silver, Gold, or Platinum certification depending on the number of credits they achieve. The developer is required to register and pay for LEED certification from the USGBC. The USGBC website indicates their cost of certification to be between $3,000 - $24,000, depending on project size. It is not clear the amount of time certification will add to a project's construction schedule, but USGBC offers expedited service for an additional fee of $10,000.

Borrego Solar Energy Production System

GreenPoint Rated. The GreenPoint Rated (GPR) system is a California-specific program managed by Build It Green™ (BIG), a non-profit California-based organization. GPR utilizes guidelines for construction and remodel of single family and multi-family homes. The program originated from the 2000 Alameda County Green Building Guidelines, and was updated in 2006 and released spring of 2007. The guidelines were developed through a collaborative multi-stakeholder process that has included State agencies such as the California Integrated Waste Management Board, State Energy Commission, Department of Water Resources, and the Air Resources Board, local governments in Northern and Southern California, energy and water utility companies, product suppliers and major production builders.

The GreenPoint Rated program provides a menu of items for the builder to choose from, with a minimum of points required from five different categories: Community, Energy, Indoor Air Quality and Health, Resources and Water. The menu items are tailored to meet the California climate, building code, and other regulatory conditions, such as Title 24 energy efficiency standards. Prerequisites for all development using this system



Single Family GreenPoint Checklist date:

Build It Green — Smart Solutions From The Ground Up

The GreenPoint Checklist is based on the various green features incorporated into the home and is the basis for the GreenPoint Rated program. A home can be considered green if it fulfills the prerequisites, earns at least 50 points, and meets the minimum points per category: Energy (30), Indoor Air Quality/Health (5), Resources (6), and Water (9). Please contact Build It Green for a list of qualified GreenPoint Raters if you are interested in pursuing third-party verification.

The green building practices listed below are described in the New Home Construction Green Building Guidelines, available at www.builditgreen.org.

ENTER PROJECT NAME	Points	Commu	Energy	IAQ/Hea	Resourc	Water
A. SITE		Points Available Per Measure				
1. Protect Native Soil and Minimize Disruption of Existing Plants & Trees						
☐ a. Protect Native Topsoil from Erosion and Reuse after Construction	0	1				1
☐ b. Limit and Delineate Construction Footprint for Maximum Protection	0					1
☐ **2. Deconstruct Instead of Demolishing Existing Buildings On Site**	0				3	
3. Recycle Job Site Construction Waste (Including Green Waste)						
☐ *a. Minimum 50% Waste Diversion by Weight (Recycling or Reuse) - Required*	0				R	
☐ b. Minimum 65% Diversion by Weight (Recycling or Reuse)	0				2	
☐ c. Minimum 80% Diversion by Weight (Recycling or Reuse)	0				2	
4. Use Recycled Content Aggregate (Minimum 25%)						
☐ a. Walkway and Driveway	0				1	
☐ b. Roadway Base	0				1	
Total Points Available in Site = 12	0					
B. FOUNDATION		Points Available Per Measure				
1. Replace Portland Cement in Concrete with Recycled Flyash or Slag						
☐ a. Minimum 20% Flyash or Slag	0				1	
☐ b. Minimum 25% Flyash or Slag	0				1	
☐ **2. Use Frost-Protected Shallow Foundation in Cold Areas (C.E.C. Climate**	0				3	
☐ **3. Use Radon Resistant Construction (In At-Risk Locations Only)**	0			1		
4. Design and Build Structural Pest Controls						
☐ a. Install Termite Shields & Separate All Exterior Wood-to-Concrete Connections by Metal or	0				1	
☐ b. All New Plants Have Trunk, Base, or Stem Located At Least 36 Inches from Foundation	0				1	
Total Points Available in Foundation = 8	0					
C. LANDSCAPING		Points Available Per Measure				
1. Construct Resource-Efficient Landscapes						
☐ a. No Invasive Species Listed by Cal-IPC Are Planted	0					1
☐ b. No Plant Species Will Require Hedging	0				1	

Single Family GreenPoint Rated Checklist
Build It Green™

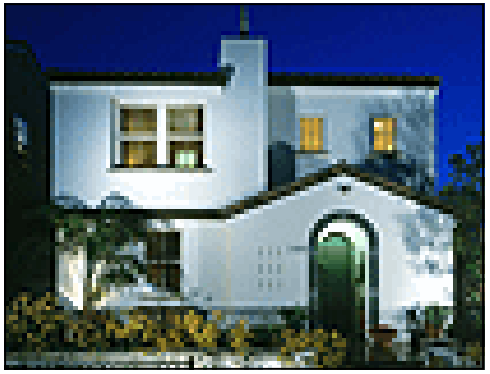
include exceeding Title 24 standards by 15% and requiring a minimum 50% of waste diversion. Homes are rated by third-party trained and certified GreenPoint Raters and a rated home achieving 50 points may be certified as a Green Rated Home. A significant component of these guidelines, particularly for subdivisions, is the Community category which promotes healthy community development, including walkable and safe neighborhoods. These guidelines also begin to address Low Impact Development standards and incorporate best management practices for managing stormwater runoff.

The GreenPoint the Rated program addresses home construction and remodeling, as well as sustainable neighborhoods and low impact development BMPs

Build It Green™ also has available the "Ask An Expert" telephone hotline. This is set up to provide technical assistance and answer green building questions on demand, and could be made available to applicants for development projects. The program is also consistent with other residential green building initiatives, such as LEED for Homes and Energy Star. For example, compliance with the guidelines of the California Friendly Home Program of the Southern California Metropolitan Water District, will earn the builder points in the GreenPoint Rated rating system. It is important to note that Build It Green™ has also established an agreement with the LEED for Homes provider in California (Davis Energy Group), to cross-train raters so that a home that is to be rated for LEED certification may also be rated for GreenPoint Rated by the same rater. The project developer will be required to pay all costs related to third-party verification. GPR cost estimates for a single family home range from $500-$1,500, and for a multifamily building $3,300-$19,000.

California Green Builder. The California Green Builder (CGB) program is a California-specific program developed by the Building Industry Institute, the research arm of the California Building Industry Association, with input from sev-

eral production home builders. The CGB program incorporates a third-party verification system, utilizing existing Title 24 Home Energy Rating System (HERS) Raters that have received additional California Green Builder Training. The Program includes a set of prescriptive guidelines and standards that must be followed to qualify as a California Green Certified Home, and is specifically designed for new single family home construction. The guidelines set goals for improved energy efficiency, indoor air quality, waste recycling, and water and wood conservation by requiring participants to build homes that:



Portico Home by Pardee, San Diego
Certified California Green Builder
and LIVINGSMART Neighborhood

- Exceed Title 24 energy efficiency standards by at least 15%;
- Use at least 20,000 gallons per year less water than conventionally constructed homes;
- Use engineered wood products primarily from sustainably harvested forest resources;
- Reduce wood waste during construction;
- Divert at least 50% of construction waste from landfills; and
- Improve indoor air quality.

The project developer will be required to pay all costs related to third-party verification. CGB cost estimates for a single family home is $400, with an additional $50 certification fee for each home within a subdivision.

The California Green Builder program includes a set of design standards that must be followed to qualify as a California Green Certified Home.

TABLE 4. TYPICAL COSTS FOR PROJECT CERTIFICATION FOR THE THREE DIFFERENT THIRD-PARTY GUIDELINES AND RATING SYSTEMS REVIEWED

	LEED for Homes	GreenPoint Rated	California Green Builder
One home	$3,850-4,150	$500-1,500	$450
Subdivision 60 units	$30,000	$3,300-$19,000	$3,400

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 189P. ASHRAE 189P provides a minimum standard for the design of green buildings. This standard is being developed in conjunction with the Illuminating Engineering Society of North America (IESNA) and the USGBC, and is said to be the first national baseline green building standard proposed in United States, and is anticipated to be published by the end of 2007.

ASHRAE 189P will be applicable to all new and major renovation building projects, with the exception of low-rise residential projects. ASHRAE 189P will address energy efficiency, a building's impact on atmosphere, sustainable sites, water use efficiency, materials and resources and indoor environmental quality. It is being developed for the inclusion into building codes. Energy efficiency will be a significant part of the standard, with a goal of achieving a minimum of 30% reduction in energy use and CO2 production.

C. Stakeholder Outreach

Staff continues to conduct extensive stakeholder outreach. Stakeholders that have provided guidance and input into the Green Building Program include both small and major production developers. The primary goal of the meetings thus far has been to receive input on priority issues and the type of program that would be supported. Outreach meetings will continue as program details are further developed. Future meetings are also anticipated once the Program is underway to monitor its ongoing success.

Priority issues for those consulted include reducing water consumption, increasing use of recycled water, site development and stormwater management, waste management and energy efficiency. Key factors of concern for a green building program identified by the building community are affordability, that there are options within the green building measures to be used, that they have the ability to reach different levels of green, that there is a level of certainty with any outside rating system that may be required, and that the program is flexible and can accommodate changing public policy and requirements, such as Title 24.

D. Jurisdictional Survey

Staff has conducted a survey of public agencies that have implemented green building programs or are in the final process of doing so. The intent of the survey was to provide County staff with a better understanding of the different components of green building programs, the resources required, and the best way to develop and implement them.

Sixteen public agencies within and outside of California, specifically chosen because they have already implemented or are close to finalizing green building programs, were surveyed; however, they represent only a fraction of those cities and counties that have programs nationally. Agencies surveyed within California include Alameda County Waste Management Authority (ACWMA), and the cities of Berkeley, Calabasas, San Francisco (still being developed), Cotati, Los Angeles (still being developed),

Green Streets
Portland, OR

Palmdale, Pasadena, Santa Monica, Livermore, Oakland, and West Hollywood. Agencies surveyed outside of California include Chicago, IL, Portland, OR, Scottsdale, AZ, and Seattle, WA. Through this survey, the County has learned from other jurisdictions their successes and mistakes, the value of voluntary versus mandatory requirements, and incentives for further action on the part of the applicant. Public agencies interviewed also provided recommendations on how to best proceed in developing a Green Building Program, including preliminary steps, program components, and mistakes to avoid. Questions asked in each interview are located in Appendix B.

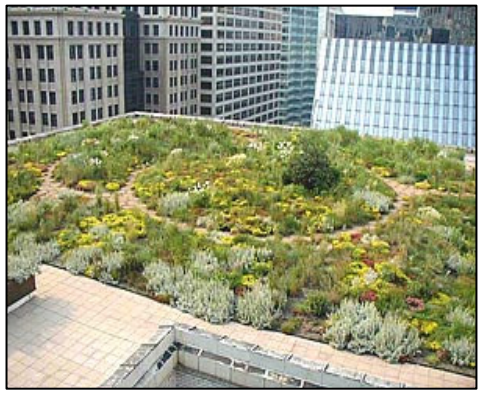
Vegetated Swale
Portland, OR

Program Types

Of the jurisdictions surveyed, a majority have a mandatory component to their green building program, and many also have voluntary incentive-based elements to their programs. Only one city, Santa Monica, made amendments throughout their municipal code to incorporate green building standards. The amended portions of their Municipal Code include Public Works, Sanitation and Health, Planning and Zoning, and Building Regulations; all of which address siting and form, landscape, transportation, building envelope, materials, water systems, construction management, and energy requirements.

All of the other cities with mandatory programs adopted an ordinance, resolution, initiative or policy that mandates the use of certain green building guidelines, standards and/or certification requirements. These include mandatory compliance with either established (i.e. LEED) or unique guidelines and checklists. One such city that established their own guidelines and checklist is West Hollywood. Though based on the Build It Green

standards, the city's guidelines have been tailored specifically to their needs and most common types of development. Both West Hollywood and Santa Monica identify either in their checklist or clearly on their website the green building standards that are already required within their Municipal Code. Further, both Cotati and Pasadena require applicants to identify more points than required on their checklists to ensure that the minimum number of required points is met.



City Hall Green Roof
Chicago, IL

Four cities have incorporated policy language into their General Plans; however, this language usually addresses sustainability in general and not green building specifically. At least two cities, Scottsdale, and Cotati, plan to include green building specific language when they next update their plans.

Two cities, Cotati and Scottsdale, designed their ordinances and/or programs and accompanying green building guidelines and checklists to be "living documents" so that they can be easily updated to address changes in technology and information. Cotati's Resolution was specifically created as a "living" document, granting the Planning Commission the discretion to modify the number of points required, the rating system and the Green Building Guidelines and Checklist.

Scottsdale has an advisory committee that updates the voluntary guidelines and checklists. Since its inception in 2001, there have been three major revisions to the program. Chicago's program, like Scottsdale's, is only a policy and not legislated; thus, their program is flexible and updated fairly easily, most often with the help of focus groups. The guidelines for West Hollywood are a component outside of the ordinance, so they can be

changed without requiring an amendment. To keep up with advancing technology, other cities that refer to outside programs, such as LEED and Energy Star, rely on those parent agencies to maintain their standards to accommodate the most up-to-date technology, information and public policy.

A "living" document is created when the green building guidelines are not embedded within the ordinance

Other program components include:

- Requiring the applicant to work with a green building professional. Both Pasadena and Cotati require applicants to work with a professional through the duration of the project, and Berkeley requires that all applicants meet with Build It Green at the beginning of the planning process.
- Requiring the use of the LEED guidelines, and registering the development project, but not actually requiring certification, so as to avoid the time and financial constraints.
- Requiring prerequisites for all new construction projects. For example, Cotati requires new projects to exceed Title 24 requirements by 15%, pre-plumb for solar hot water, incorporate 30% flyash, and utilize 50% native plants, 80% drought tolerant species and 80% drip irrigation in landscape projects.

Build It Green
Smart Solutions From The Ground Up

Applicability

Table 5 summarizes the type of projects that are applicable within the cities' green building programs, and whether they are voluntary or mandatory. All but one city shown have mandatory programs for their civic development (most require LEED certification), with a mix of mandatory and voluntary programs for other types of development. Thresholds of applicability range from 2,500 ft^2 for residential development in Cotati to greater than 50,000 ft^2 for non-residential development in Los Angeles. Two cities, Portland and Chicago, have mandatory programs for all city-funded projects that require LEED certification or other Green Building

TABLE 5. TYPE OF PROJECTS APPLICABLE, MANDATORY (M) OR VOLUNTARY (V)

City	Single Family Residential	Multi-Family Residential	Commercial, Industrial, Mixed Use	Civic Projects	Notes
Berkeley	V	V	V	M: >7,500 s.f. LEED Certified	Mandatory meeting with Green Building Consultant for all projects
Calabasas	--	--	M: 500-5000 s.f. LEED Certified > 5000 s.f. LEED Silver	M: 500-5000 s.f. LEED Certified > 5000 s.f. LEED Silver	
Cotati	M: > 2500 s.f. GPR	M: > 2500 s.f. GPR	M: > 2500 s.f. GPR	M: > 2500 s.f. GPR	
Los Angeles	V	M: Baseline standards LEED > 50 units or 50,000 s.f. LEED Certified V: LEED Silver	M: Baseline standards LEED > 50 units or 50,000 s.f. LEED Certified V: LEED Silver	M: >7500 s.f. LEED Certified	sill being developed
Palmdale	--	--	--	--	M: Drought tolerant landscaping and Waste Diversion
Pasadena	V	M: > 4 stories LEED Certified	M: New and T.I. >25,000 s.f. LEED Certified	M: > 5000 s.f. LEED Certified	
San Francisco	V	V	M: > 25,000 s.f. LEED Certified	M: LEED Silver	Still being developed Graduated mandatory Program for LEED and GPR for all development types due to begin January 2009
Santa Monica	V	V	V	M: LEED Silver	Mandatory baseline standards for all development
West Hollywood	V	M: Green Building Point System 60 Points	M: Green Building Point System 60 Points	M: LEED Certified	90 Points qualifies for incentives
Oakland	V	V	V	M: LEED Silver > $3 Million	
Livermore	M: GPR	M: GPR	M: LEED	V	
Chicago	M: city-funded, planned dev V: all other	M: city-funded, planned dev V: all other	M: city-funded V: all other	M: LEED-based guidelines	
Portland	M: planned dev V: all other	M: planned dev V: all other	M: city-funded V: all other	M: New: LEED Gold Ren and TI: LEED Silver	Mandatory baseline standards for all development
Scottsdale	V	V	V	M: LEED Gold	
Seattle	V	V	V	M: > 5000 s.f. LEED Silver	

LEED = Leadership in Energy and Design GPR = GreenPoint Rated TI = Tenant Improvement

applications. The table in Appendix A provides more detailed information on the different types of programs each city has adopted, including incentives for voluntary programs.

Incentives range include expedited permitting, development bonuses, fee waivers, money, technical assistance, and a variety of tax credits, rebates and grants.

Incentives

Table 6 summarizes the different types of incentives used to encourage builders to incorporate green building practices within voluntary programs. Incentives offered include expedited permits, density and/or height bonuses, fee waivers, financial incentives, technical assistance, and a variety of tax credits, rebates and grants.

At least two cities, Scottsdale and Chicago, utilized advisory groups to help identify incentives that would be well received and most effective. Both of these cities offer expedited permits for their applicants complying with their respective voluntary green building programs, and have found this incentive to be very successful.

Portland has established the Green Investment Fund that makes $425,000 available every year for industrial, residential, commercial, and mixed-use projects to attain LEED certification.

The Green Permitting Program for Chicago has proven to be their most effective incentive. To ensure that qualifying projects are expedited within the promised amount of time, Chicago has contracted with a team of consultants to expedite the projects. Normally, this team of consultants is available for hire by applicants to expedite conventional projects more rapidly; though the City pays the consultant fee for qualifying green projects. The Green Building Program of Scottsdale also offers expedited permits for complying with their green building guidelines and checklist. The program's success has been measured through participation rates. At the beginning of the program in 2001, there was a 1% participation rate. By 2004 there was a 25% participation rate. In 2006, there was a 35% participation rate. Clearly, this one incentive has proven powerful enough to cause this kind of increase in green building practices.

TABLE 6. INCENTIVES

Agency	Expedited Permits	Density and/or Height Bonus	Fee Waivers	Financial Incentives	Technical Assistance	Tax Credits, Rebates, Grants
Chicago	X		X			X
Berkeley						X
Los Angeles	X				X	X
Pasadena				X	X	X
Portland					X	X
San Francisco						
Santa Monica	X			X		X
Scottsdale	X					X
Seattle		X				X
West Hollywood		X				X

Another helpful tool has proven to be free technical assistance. Three cities, Pasadena, Los Angeles, and Portland offer free assistance. For Pasadena, this entails providing a certified green building consultant for the entire development process for those applicants that are required to comply with the city's green building program.

Other programs include a variety of grants, tax credits, rebates and funds. One example is the city of Portland that has established the Green Investment Fund (a multi-department collaboration) that makes available $425,000 a year for industrial, residential, commercial, and mixed-use projects, both public and private, to at-

tain LEED certification. Pasadena and Santa Monica offer funds for LEED certification. For example, the higher the level of certification (Gold, Platinum) attained by the applicant, the more money offered; up to $35,000 for LEED Platinum in Santa Monica.

Advisory Committees and Consultants

Table 7 summarizes some of the different types of committees, consultants and advisory groups that have been utilized by cities for varying purposes. Some cities used consultants from the beginning to help establish their programs, while others relied on strong inter-department teams or established advisory committees and stakeholder groups to assist with program development, incentives and implementation.

DCAP Green Permit Requirements

PROJECT TYPE	BENEFIT TIER 1	BENEFIT TIER II	BENEFIT TIER III
	Expedited permit (goal <30 days)	Consultant review fee paid up to $25,000 Expedited permit (goal < 30 days)	Consultant review fee 100% waived Expedited permit (goal <15 days)
RESIDENTIAL Market Rate Single Building (<10 units)	Not applicable	Chicago Green Homes + 1 Menu Item	Chicago Green Homes + 3 Menu Items
Market Rate Multiple Buildings (<10 units/building)	Not applicable	Chicago Green Homes + 2 Menu Items	Chicago Green Homes + 3 Menu Items
20 % Affordable Development (<10 unit/building)	Not applicable	Chicago Green Homes + 1 Menu Item	Chicago Green Homes + 3 Menu Items
Market Rate Multifamily	LEED Certified	LEED Certified + 1 Menu Item	LEED Gold + 2 Menu Items
20% Affordable Multifamily (<80 feet tall)	Chicago Green Homes + 1 Menu Item	Chicago Green Homes + 2 Menu Items	LEED Certified + 2 Menu Items
INSTITUTIONAL Hospitals	LEED Certified + 1 Menu Item	LEED Silver + 1 Menu Item	LEED Platinum or LEED Gold + 2 Menu Items
Community Centers and Schools	Not applicable	LEED Certified + 1 Menu Item	LEED Gold + 1 Menu Item
INDUSTRIAL	Not applicable	LEED Certified + EnergyStar Roof	LEED Gold or LEED Silver + 2 Menu Items
COMMERCIAL Retail over 10,000 square feet (footprint)	LEED Certified + EnergyStar Roof + 1 Menu Item	LEED Silver + 25% Green Roof + 1 Menu Item	LEED Gold + 50% Green Roof + 1 Menu Item
Retail under 10,000 square feet (footprint)	LEED Certified + 1 Menu Item	LEED Silver + 1 Menu Item	LEED Platinum or LEED Gold + 2 Menu Items
Office over 80 feet tall	LEED Certified + 50% Green Roof + 1 Menu Item	LEED Silver + 75% Green Roof + 1 Menu Item	LEED Platinum or LEED Gold + 75% Green Roof + 2 Menu Items
Office under 80 feet tall	LEED Certified + 1 Menu Item	LEED Silver + 1 Menu Item	LEED Platinum or LEED Gold + 2 Menu Items

Building Green in Chicago, IL

TABLE 7. COMMITTEES, TEAMS AND CONSULTANTS

City	Committees, Teams and Consultants
Pasadena	Inter-department team to establish program include the Departments of Fire, Planning, Water and Power, Public Works Global Green as consultant from the beginning Green Ribbon Committee of stakeholders
Chicago	Inter-department team to establish the Building Green/Green Roof Matrix policy Have utilized several different focus groups and task forces to serve ongoing roles, including: helping to establish the program and update the program. They are currently working to make it more efficient and remove any internal barriers to green building. The groups include developers, contractors, architects, and lawyers
Los Angeles	Green Building Cabinet (stakeholder group) includes department heads, developers, environmental organizations, US Green Building Council, and Global Green
West Hollywood	Global Green as consultant from the beginning Green Ribbon Committee of stakeholders
Scottsdale	Utilize several advisory committees for many purposes, including: program establishment, program updates, and to give presentations and workshops to the public. They have been much of the power behind the program. Groups are comprised of representatives from the solar energy commission, architects, contractors, product suppliers, designers, and academia
Seattle	Utilize a variety of consultants for different projects and programs Utilize many different stakeholder groups for different projects and programs Inter-department teams work collaboratively to establish different programs

Application Procedures and Compliance

The following table summarizes different types of application procedures and compliance measures utilized by cities to implement and enforce both voluntary and mandatory green building guidelines and standards. Table 8 provides greater detail on some of the types of procedures and compliance measures utilized by different cities; however, the following summarizes some of the elements:

For cities that require LEED certification, the planning department often requires the applicant to submit proof of LEED project registration with the US Green Building Council or a letter of intent. Calabasas, Chicago and

TABLE 8. APPLICATION PROCEDURE AND COMPLIANCE

City	Application Procedure	Compliance
Berkeley	Applicant must meet with Build It Green to identify green measure that might be incorporated into the project.	Applicant must submit checklist as part of approval process
Calabasas	Required to submit documentation of LEED registration (not required to obtain certification)	If applicant is not obtaining certification, the Director shall determine compliance. If found project found incompliant, will not receive the Certificate of Occupancy
Chicago	Detailed application procedure. Applicant begins process by attending Green Permit Program orientation meeting and submitting documentation outlining all green building components	Planning department requires the applicant to provide documentation throughout the development process to ensure compliance is met
Cotati	Detailed application procedure including: Planning Stage, Building Permit Stage, Construction/Inspection Stage	Post construction requirements include Green Points calculation, photos, receipts and other documentation to obtain a Certificate of Occupancy If applicant does not achieve minimum points, he must go back and incorporate more green measures
Pasadena	Detailed application procedure including: Pre-Plan Check, Initial Plan Check Submittal, Plan Check Corrections, Final Sign-off, Construction	Applicant must submit paperwork showing USGBC registration & checklist to LEED-AP If applicant does not comply, City will submit a stop work order
Portland	Application process includes Progress Reports, a Final Report and Determination	City requires Good Faith Deposit of $10,000 to ensure compliance At the end of construction, if the applicant is not able to comply, he may submit a “Request for Waiver” as support that there was a “good faith effort” to comply. The Director shall determine approval or denial based on documentation.
Santa Monica	Normal application process	B&S responsible for determining compliance during plan check
Scottsdale	Detailed application procedure including: Project Qualification/Pre-Application Meeting, Application for Plan Review and Building Permit, Plan Review, Re-submittals, and Building Permit and Inspections	Applicants voluntarily entering the Green Building Program are required to attend at least 2 green building related seminars, lectures or workshops Projects not able to maintain Program qualification are required to resubmit plans for revisions as a non-participating project
Seattle	Detailed application procedure including: Applicant submittal of letter of intent for LEED silver, Issuance of permits by the city based on good faith commitment, Document submittal of LEED certification by applicant within 90 days of Certificate of Occupancy	Failure to submit a timely report or earn LEED silver rating will result in penalty of $500/day Failure to demonstrate performance (i.e. Independent report by USGBC result in financial penalty) All funds collected go to the Green Building Fund.
West Hollywood	Program generally designed to fit into the standard application review and approval process without additional steps, submittals, or application fees. Additional action requires the applicant to submit green building plan identifying how project will achieve required number of points as part of the project submittal for plan check.	City staff responsible for administering point system. Each point assigned to a division for review/verification Each division identify inclusion of green points in project plans both at planning submittal and during concurrent plan check, and at the time of final inspection Building inspectors verify compliance in the field

Pasadena require this. Although the city of Berkeley does not require certification for non-civic projects, they do require that all applicants submit a checklist identifying all of the green building measures that may be incorporated in the project as part of approval process.

Land Development Coordinating Center
Department of Regional Planning

Many cities provide very clear details of each stage of the project development process, from initial meetings with a green building professional to the final construction and inspection stage that may also involve a green building professional and/or third-party rater. Cities that have a detailed stage-by-stage permitting process include Chicago, Cotati, Pasadena, Scottsdale and Seattle. Others simply require some documentation with the project document submittal that a meeting took place or a checklist has been reviewed or included.

Determining compliance and measures taken for non-compliance range greatly. Penalties for non-compliance often involve denying the applicant the Certificate of Occupancy. For some cities, the applicant that has not achieved enough points on a checklist or has not obtained proper certification must find ways to incorporate more green building elements into the project. The project will be reevaluated, and eventually the Certificate of Occupancy will be issued. Some cities, such as Pasadena, may give a stop work order if the building is not being constructed as agreed. Some cities impose greater penalties. If the applicant does not provide documentation of LEED certification, Seattle will impose a $500 per day penalty for non-compliance. Collected funds

going to the city's Green Building Fund. In Portland, applicants are required to give a Good Faith Deposit of $10,000 to ensure compliance.

Green Building Resource Center
Santa Monica, CA

Public Outreach and Education

The following summarizes some of the different types of public outreach and educational efforts made by the jurisdictions interviewed.

TABLE 9. PUBLIC OUTREACH AND EDUCATION

City	Public Outreach and Education
Alameda County	Extensive website information on green building, guidelines, links to resources, etc. Provide model ordinances, resolutions, general plan language and policy tools
Berkeley	Extensive website information on green building, guidelines, links to resources, etc
Chicago	Extensive website information on green building, guidelines, links to resources, etc Chicago Center for Green Technology
Pasadena	Extensive website information on green building, guidelines, links to resources, etc Offer a series of free workshops for the residential community and the development community Green Building Tours
Portland	Extensive website information on green building, guidelines, links to resources, etc Green Home Tours CAD details for selected green building standards
Santa Monica	Extensive website information on green building, guidelines, links to resources, etc
Scottsdale	Extensive website information on green building, guidelines, links to resources, etc Monthly Green Building Lecture Series Annual Green Building Expo and Annual Green Building Design Day CAD details for green building standards
Seattle	Extensive website information on green building, guidelines, links to resources, etc Free green building forums and workshops Green Building Training Programs
West Hollywood	Green Building Resources Center at City Hall Informational brochures Green Product Guide Educational boards at City Hall

Costs to Jurisdictions

Most cities reported minimal costs for establishing green building programs, sometimes requiring no more than training and dedicated staff hours to establish and implement the program. Many cities, though, have at least one full-time staff member dedicated to maintaining and implementing the program. Dedicated staff members are usually within the city's planning department and/or building and safety department. Beyond dedicated staff members, training for green building is often extended to staff members throughout the cities' affected departments; often this is specific training to be a LEED Accredited Professional; such is the case with the City of Pasadena. It is important to note that, although the cities' building inspectors may be the ones responsible for overseeing what actually gets built and that all green building standards are implemented, they do not necessarily need special training. The inspectors need only to follow the construction documents that have already incorporated all of the green building standards.

Village Homes
Davis, CA

For some cities there were fees for consultant services used in helping to establish the green building programs. The most common consultants used were Global Green and Build It Green. Consultant fees for this type of service typically range from $25,000 to $40,000, as a one-time fee. At least two cities, Chicago and Pasadena, have ongoing consultant fees for the implementation of their programs. Chicago offers free expedited permits for complying with the voluntary green building program through an outside contracted permitting consultant. Pasadena offers the free service of a green building professional for the duration of projects that are required to comply with the city's green building program. Other costs to jurisdictions include fee waivers, grants, rebates and other monetary incentives, as well as printed educational materials.

Program Results

Almost all of the policy initiatives are in the initial stages of implementation, and thus do not have concrete outcomes or measurable results. While cities that have had programs for a number of years are able to track the number of projects that have incorporated green building standards into their projects, most are not yet at the stage where they are able to track their progress and/or efficacy. One tool being considered by some jurisdictions for measuring improvements in energy efficiency and reductions in greenhouse gas (GHG) emissions is the California Climate Action Registry. The Registry is a voluntary program that assists companies and agencies with operations in the state to establish GHG emissions baselines against which any future GHG reduction requirements may be applied, and future increases of energy efficiency may be determined.

Vegetated Swale
Village Homes in Davis, CA

Recommendations from Jurisdictions

The following highlight some of the key recommendations that city representatives recommended on establishing a green building program. They address some internal issues, such as ensuring that barriers to green building are identified and removed, as well as the significance of establishing a legally mandated program, such as an ordinance and/or amendments to the County Code.

- Review existing policy and ordinances within the municipal code and have each department perform an evaluation of what "green" codes already exist within and throughout the municipal code. Department representatives and stakeholder groups should then come together to share existing codes to achieve the following goals: put all existing green development policies and standards into one docu-

ment for applicant's ease of use; solidify the city's goals and intentions; ensure each department is implementing codes in the same manner; identify barriers within the codes that might prevent green standards from being implemented.

- All cities stated the importance of working collaboratively with other effected city departments and advisory committees and/or stakeholder groups. Those cities that did not, highly recommend it, and are now in the position of having to backtrack and work with those groups to establish and implement the programs and policies.
- Regarding mandatory and voluntary incentive-based programs, at least two cities are implementing or are recommending incrementally phasing in green building requirements. Recommendations are to set baseline mandates and provide incentives to surpass the requirements and build greener. Incentives may gradually be phased out and new ones introduced, as certain green building measures become common practice and more stringent standards are encouraged.
- Programs are more successful when the builder has options to choose from when deciding what green building measures shall be incorporated into each particular development project.
- Legislate the Program requirements into the Municipal Code (i.e. through an ordinance), but do not incorporate actual guidelines or standards into Municipal Code, as this makes it too difficult to update.
- If the County requires compliance with third-party guidelines, ensure that an exact version is not specified, such as LEED-NC 2.3, as this may not be the most recent version available. It is better to use language that would require the use of most current version available.
- Make sure that the green building program is developed as a complete program, with a full plan or program and implementation strategies.

Programs are more successful when the builder has options to choose from when deciding what green building measures shall be incorporated into each particular development project.

IV. DETAIL OF TABLE 1 GREEN BUILDING PROGRAM RECOMMENDATIONS

The initial recommendations shown below were developed to formalize the County's commitment to sustainable construction. It is expected a future County taskforce made up of all stakeholders will focus on future opportunities to enhance the performance of privately constructed buildings and recommend new requirements. The recommendations begin as voluntary guidelines in 2008 and become increasingly more stringent over time. Using established third-party Green Building rating systems, phased in over a four-year period (2008-2011) allows the public and developers enough time to learn about sustainable building practices and effectively incorporate these construction methods into new building design. This phased-in approach also gives the County enough time to train staff, conduct public outreach, analyze costs and develop cost recovery mechanisms and develop a method to track and report on the environmental benefits of green building.

Large Commercial / Mixed Use / Hotel ≥ 25,000 Square Feet (New/Additions/Remodels w/ MEP Work)	**2008 LEED Checklist**	**2009 LEED - Certified**	**2010 LEED - Silver**	**2011 LEED - Silver**

For commercial, mixed use and hotel development construction involving 25,000 square feet or more, the standards set forth in the Leadership in Energy and Environmental Design (LEED) rating system, established by the United States Green Building Council (USGBC) must be applied. Developers may opt for using other recognized, equivalent and applicable standards such as Standard 189P (Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings) anticipated to be jointly published by the USGBC and ASHRAE by the end of 2007. In 2008, construction projects will be required to submit a

completed checklist with the building permit application documenting what type of sustainable building practices they will include in their project. Starting in 2009, construction projects will be required to submit and obtain certification from an approved green building rating system and in 2010 and 2011 will require all projects to obtain the second level of certification.

Mid-Size Commercial / Mixed Use / Hotel ≥ 10,000 to 25,000 Square Feet (New/Additions)	**2008 Voluntary**	**2009 LEED Checklist**	**2010 LEED Checklist**	**2011 LEED Checklist**

For new commercial, mixed use and hotel construction between 10,000 and 25,000 square feet the standards set forth in the Leadership in Energy and Environmental Design (LEED) rating system, established by the United States Green Building Council (USGBC) must be applied. Developers may opt for using other recognized, equivalent and applicable standards such as Standard 189P (Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings) anticipated to be jointly published by the USGBC and ASHRAE by the end of 2007. In 2009, construction projects will be required to submit a completed checklist with the building permit application documenting what type of sustainable building practices they will include in their project. Starting in 2010, construction projects will be required to meet specific mandatory LEED credits, increasing in scope in 2011.

New High Rise > 75 Feet Height	**2008 LEED Checklist**	**2009 LEED - Silver**	**2010 LEED - Silver**	**2011 LEED - Silver**

For high rise buildings of all occupancy types a LEED Checklist will be required to be provided. Starting in 2009, high-rise buildings will be required to submit and obtain a higher level of LEED certification.

New Residential	**2008 Voluntary**	**2009 Voluntary**	**2010 GPR**	**2011 GPR**

For residential development projects mandatory compliance begins in 2010. The developer could choose from existing green building rating systems such as the GreenPoint Rated (GPR) system managed by Build it Green or the California Green Builder Program (CGB) of the California Building Industry Association. Developers may opt for using other recognized, equivalent and applicable rating systems currently under development such as LEED Homes (currently a pilot program), LEED Neighborhood Development (currently a pilot program), or the National Green Building Standard jointly published by the International Code Council and the National Association of Home Builders (anticipated publication date of February 2008).

Implementation of the recommendations will help the County conserve water, increase energy efficiency, utilize appropriate building materials, reduce waste, and improve human health.

This program could be modified in the year 2011 to utilize the proposed California Green Building Standards. The California Green Building Standards will be mandatory statewide standards anticipated to be published by the California Building Standards Commission in 2010 during the next building standard adoption cycle.

V. CONCLUSION

In California on September 27, 2006, Governor Schwarzenegger signed AB32, which requires that all jurisdictions within the state to reduce their CO2 footprint to 1990 levels by 2020. Given the remarkable impact that the design and function of buildings and communities has on the environment, implementing the recommendations contained in this report will help Los Angeles County achieve compliance with this state mandate, reduce its overall contribution of greenhouse gas emissions within California, and help alleviate the progression of global warming. Green Buildings and better site design, as provided in the recommendations, will also result in healthier and more productive environments, in which the people of Los Angeles County live and work.

The recommendations described herein for the further development of the County's Green Building Program respond to the January 16, 2007 Board Motion by offering a proposed program that will incorporate third-party green building rating systems for industrial, commercial and residential development. Implementation of these recommendations will help the County achieve its goals to conserve water, increase energy efficiency, utilize appropriate building materials, reduce waste, and improve human health.

APPENDIX A, PROGRAM DETAILS

City	Mandatory Programs	Mandate	Voluntary Programs	Incentives for Voluntary Programs
Cotati	Mandatory for all development	Require all new residential and commercial development and all commercial additions and remodels of > 2500 ft^2 to use BIG Green Guidelines Green Points Checklist, attaining a minimum of 90 points. Applicant must work with a certified green professional as a consultant and as a third-party rater Require as prerequisite 15% above Title 24 (stemmed form Energy Star, but recommended by USGBC – BIG going to include this in future checklists) Pre-plumb for solar hot water Incorporate 30% flyash Utilize 50% native plants, 80% drought tolerant species, 80% drip	--	--
Berkeley	Mandatory	Require City buildings to be LEED All other types of development required to meet with Build It Green for consultation, but no actual requirements for implementation	--	--
Calabasas	Mandatory for city buildings, nothing for other types of development	LEED 500-5000 ft2 – Certified >5000 ft^2 - Silver	--	--
Los Angeles (still being developed)	Mandatory for: Municipal buildings >7500 ft^2 Private development projects greater than 50 units or larger than 50,000 ft^2	Require new City projects > 7500 ft^2 to be LEED-Certified (soon require LEED-Silver) Require new baseline standard of sustainability for all projects Require new projects greater than 50 units or larger than 50,000 sq. ft. to meet intent of LEED-Certified	Voluntary, incentive-based program for implementing standards for sustainable excellence: LEED-Silver for New Construction Commercial Interiors Core & Shell Existing Building Home	Proposed Incentives include: Financial Incentives Expedited Processing Green Case Management Technical Assistance Mayoral Awards Also several incentives through different City departments. Solar Incentive Program Energy Efficiency Program Tree Planting Program Green Power for a Green LA Water Conservation
Palmdale	Palmdale Water Efficient Landscape Ordinance Palmdale Native Desert Vegetation Ordinance	Applicable to all new and rehabilitated landscaping for public agency projects; commercial, industrial and institutional projects; and developer-installed landscaping in single-family and multi-family projects. Requires applicable projects to achieve a minimum number of points from the City's list of water conservation techniques from the Planting Plan list and the Irrigation Plan list. 65 points of 80 required from the Planting plan list, and 60 points of 90 from the Irrigation plan list. The Palmdale Native Desert Vegetation Ordinance is similar to the County's Oak Tree Ordinance, but protects joshua trees and other defined desert vegetation	--	--

APPENDIX A, PROGRAM DETAILS, CONTINUED

<table>
<tr><th>City</th><th>Mandatory Programs</th><th>Mandate</th><th>Voluntary Programs</th><th>Incentives for Voluntary Programs</th></tr>
<tr><td>Pasadena</td><td>Mandatory for:
Municipal buildings >5000 ft2 of new construction
Non-residential buildings >25,000 ft2 of new construction
Tenant improvements >25,000 ft2 that require building permit
Mixed-use and multi-family residential >4 stories</td><td>Require:
Project registration with USGBC (not certification)
Use LEED AP (provided by the City or applicant can choose)
Follow LEED checklist, and attain enough points for LEED Certified</td><td>Voluntary incentives by Pasadena Water and Power for attaining LEED certification</td><td>LEED certification:
Certified - $15,000
Silver - $20,000
Gold - $25,000
Platinum – $30,000</td></tr>
<tr><td>Chicago</td><td colspan="3">Mandatory for City, City-funded, & planned developments. Require a mixture of Green Building and Green Roofs, matrix identifies requirements and green options.
<table>
<tr><th>Project Type</th><th>Public Assistance:
RFPs, Negotiated Sales with land write-down, TIF, Empowerment Zone Grants, DOH</th><th>Public Assistance:
Bond Issues, Class 6b, SBIF, Enterprise Zone Facility Bonds, Bank Participation Loans</th><th>No Public Assistance:
Planned Developments, Lakefront Protection Ordinance Developments</th></tr>
<tr><td>RESIDENTIAL</td><td></td><td></td><td></td></tr>
<tr><td>Market Rate SF, TH, Multi-units < 4 units</td><td>Energy Star or LEED certification</td><td></td><td></td></tr>
<tr><td>Market Rate => 4 units</td><td>50% Green Roof and Energy Star Certification or LEED Certification</td><td>50% Green Roof and Energy Star Certification</td><td>25% Green Roof</td></tr>
<tr><td>> 20% Affordable Units or CPAN</td><td>DOH Green Criteria</td><td></td><td></td></tr>
<tr><td>INSTITUTIONAL</td><td></td><td></td><td></td></tr>
<tr><td>Hospitals</td><td>50% Green Roof or 25% Green Roof and LEED Certification</td><td>>25% Green Roof or 10% Green Roof and LEED Certification</td><td>25% Green Roof or 10% Green Roof and LEED Certification</td></tr>
<tr><td>Community Centers & Schools**</td><td></td><td></td><td>25% Green Roof or 10% Green Roof and LEED Certification*</td></tr>
<tr><td>INDUSTRIAL</td><td>10% Green Roof or Energy Star Roof and LEED Certification</td><td>>10% Green Roof and Energy Star Roof</td><td></td></tr>
<tr><td>COMMERCIAL</td><td></td><td></td><td></td></tr>
<tr><td>Retail > 10,000 ft^2</td><td>75% Green Roof or 50% Green Roof and LEED Certification</td><td>50% Green Roof or 25% Green Roof and LEED Certification</td><td>50% Green Roof</td></tr>
<tr><td>Retail < 10,000 ft^2</td><td>25% Green Roof or LEED Certification</td><td>Energy Star Roof</td><td>Energy Star Roof</td></tr>
<tr><td>Office > 80 feet</td><td>100% Green Roof</td><td>75% Green Roof</td><td>50% Green Roof</td></tr>
<tr><td>Office < 80 feet</td><td>50% Green Roof or Energy Star Roof and LEED Certification</td><td>Energy Star Roof</td><td></td></tr>
</table></td><td>Voluntary, incentive-based for all types of development. Greener projects receive greater incentives, including:

1. 30 day expedited permitting process
2. Developer service fees waived up to $25,000
3. 15 day expedited permitting process and all developer service fees waived</td></tr>
</table>

APPENDIX A, PROGRAM DETAILS, CONTINUED

<table>
<tr><th>City</th><th>Mandatory Programs</th><th>Mandate</th><th>Voluntary Programs</th><th>Incentives for Voluntary Programs</th></tr>
<tr><td>Portland, OR</td><td colspan="2">Mandatory for City, City-funded, & planned developments
<table>
<tr><td colspan="2">NEW CONSTRUCTION</td></tr>
<tr><td>Commercial / MU</td><td>LEED NC Silver Certification</td></tr>
<tr><td>Residential</td><td>Greening Portland’s Affordable Housing (ALL)</td></tr>
<tr><td>< 5 stories of the structure</td><td>Earth Advantage Green Certification</td></tr>
<tr><td>= 5 stories</td><td>Earth Advantage Green or LEED NC Silver based on configuration of building</td></tr>
<tr><td>> 5 stories</td><td>LEED NC Silver Certification</td></tr>
<tr><td>City-Owned Buildings</td><td>LEED NC Gold Certification; “Ecoroof” or “Energy Star” approved roofing material; Maintenance according to guidelines established by the Operations Bureau of General Services</td></tr>
<tr><td colspan="2">REHABILITATION</td></tr>
<tr><td>Commercial / Mixed-Use</td><td></td></tr>
<tr><td>Full-building</td><td>LEED NC Silver Certification</td></tr>
<tr><td>Partial-building
Tenant improvements</td><td>LEED CI Silver and/or
G-Rated Tenant Improvement Guide Certification</td></tr>
<tr><td>< 5 stories of the structure</td><td>Earth Advantage Green Certification</td></tr>
<tr><td>= 5 stories</td><td>Earth Advantage Green or LEED NC Silver based on the configuration of building</td></tr>
<tr><td>> 5 stories</td><td>LEED NC Silver Certification</td></tr>
<tr><td>City-Owned Buildings</td><td>LEED Commercial Interiors (CI) Silver Certification; OR
G/Rated Tenant Improvement Guide Certification</td></tr>
</table></td><td>Voluntary incentives for all other projects to attain LEED certification</td><td>Grants available for LEED certified building, with a total of $425,000 available, and max of $225,000 for one project. Sponsored by the Green Investment Fund (GIF), OSD, Bureau of Water and Environment Services, Energy Trust of Oregon (ETO)</td></tr>
<tr><td>Scottsdale, AZ</td><td>Mandatory</td><td>Require LEED Gold for all City Buildings</td><td>Voluntary Green Rating Checklists for all other types of development</td><td>Expedited plans
Solar tax credit
Job site signs</td></tr>
<tr><td>Santa Monica</td><td>Mandatory</td><td>Require all City projects to be LEED silver

Require all other projects to comply with green building codes within the Municipal Code</td><td>Voluntary incentives for all other projects to attain LEED certification</td><td>LEED
Certified - $20,000
Silver - $25,000
Gold - $30,000
Platinum - $35,000
Expedited permits for 3rd party-evaluated projects with specified certification, i.e. LEED registration
Grants for stormwater runoff mitigation systems and energy conservation up to $5000</td></tr>
</table>

APPENDIX A, PROGRAM DETAILS, CONTINUED

<table>
<tr><th>City</th><th>Mandatory Programs</th><th>Mandate</th><th>Voluntary Programs</th><th>Incentives for Voluntary Programs</th></tr>
<tr><td>Seattle, WA</td><td>Mandatory</td><td>Require LEED silver for City buildings >5,000 ft^2 (new and renovated)</td><td>Voluntary Downtown Zoning Ordinance</td><td>Ordinance offers greater height or density for LEED silver or above
Various rebates and credits for energy efficiency, water conservation, materials conservation & waste reduction, site design and landscaping, resource conservation, community building, transportation planning</td></tr>
<tr><td>San Francisco (still being developed)</td><td>Mandatory for City Buildings and other applicable projects as identified in matrix</td><td>Base requirements for other types of development:
<table>
<tr><th>Type of Development</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th></tr>
<tr><td>Commercial >25,000 ft^2 or 75’</td><td>LEED Certified</td><td>LEED Silver</td><td>LEED Silver</td><td>LEED Silver</td></tr>
<tr><td>High-Rise Res > 75’</td><td>LEED Certified</td><td>LEED Certified</td><td>LEED Silver</td><td>LEED Silver</td></tr>
<tr><td>Commercial Interiors & Major Alterations >25,000 ft^2</td><td>LEED Certified</td><td>LEED Silver</td><td>LEED Silver</td><td>LEED Silver</td></tr>
<tr><td>Commercial 5,000-25,000</td><td>--</td><td>3 LEED credits</td><td>4 LEED credits</td><td>6 LEED credits</td></tr>
<tr><td>Multifamily >5 units and < 75’</td><td>--</td><td>GPR 25 Points</td><td>GPR 50 Points</td><td>GPR 75 Points</td></tr>
<tr><td>Res 1-4 units</td><td>--</td><td>GPR 25 Points</td><td>GPR 50 Points</td><td>GPR 50 Points</td></tr>
</table></td><td></td><td>Incentives being developed include: development bonuses, waived fees, expedited permits</td></tr>
<tr><td>West Hollywood</td><td>Mandatory</td><td>New regulations within the Municipal Code applicable to all new development.

Require all new commercial and residential projects with 3 or more units to comply with and attain 60 points from Green Building System Table (based on Alameda County/ BIG guidelines) or attain LEED Certification.</td><td colspan="2">If attain 90 points or more on the Green Building System Table, builder may choose from menu of incentives:
<table>
<tr><td>Multi-family residential or mixed-use</td><td>• 1 adtl. residential unit, ≤ 700 ft^2, without adtl. parking required
• 100% common space may be on roof if 50% of roof is vegetated
• Private open space may be provided as common open space area</td></tr>
<tr><td>Multi-family residential</td><td>• Area in side setbacks may be used to satisfy common and/or private open space area req</td></tr>
<tr><td>Commercial or mixed-use projects</td><td>• 0.1 FAR increase
• New restaurant tenant spaces <1200 ft^2 may provide parking at a ratio of 3.5 spaces per 1000 ft^2, up to 2400 ft^2
• Receive 50% reduction in required parking spaces (on commercially-zoned lots which are 40 ft or less in width and have alley access)</td></tr>
<tr><td>All projects</td><td>• Expedited permit and preferential Planning Commission scheduling when feasible</td></tr>
</table></td></tr>
</table>

APPENDIX B, Green Building Survey Questionnaire

1. What type of format does your green building program take?
    a. Is it an ordinance (such as a green building ordinance), a resolution, a mandate, etc…?
2. What types of projects does it apply to, i.e. residential, commercial, industrial, municipal?
    a. What are the different requirements for each of these types of developments?
3. Does your green building program require LEED certification, or does it include other, similar guidelines or established checklists?
    a. If you are requiring LEED certification, what level do you require – certified, silver, gold, platinum?
    b. If you are using other guidelines, did you develop them or did an outside consultant develop them?
    c. If you based your program on Build It Green's (or other) guidelines, what process did you go through to transform the Guidelines to your city's own in-house point system?
4. Are your guidelines voluntary or mandatory?
5. How do you plan to keep up with improving technology?
6. Why did you choose not to require LEED certification?
7. How do you determine compliance?
    a. If requiring LEED certification, does the applicant have to submit their official certificate prior to receiving final project approval?
    b. If yes, have you had any issues such as projects not being certified, but are nonetheless certified for occupancy?
    c. What if the applicant does not comply or fulfill requirements – any repercussions?
8. When establishing your green building program, did you utilize an outside consultant or did you primarily rely upon staff research to decide what type of program your jurisdiction would utilize?
9. How long did it take to establish and enact your green building program?
10. Would you consider the program a "work-in-progress"?
11. Do you and/or your applicants regularly work with an outside green building consultant on a project-by-project basis?
12. Is your staff responsible for plan-checking projects for compliance with green building guidelines or receipt of certifications?

13. If a green building program does exist in your jurisdiction, have you conducted a performance review of the effort? For example, have you measured improvements to energy efficiency?
14. Has there been a quantified cost to your jurisdiction associated with implementing your green building program?
15. Have you found that the implementation of a green building program requires collaboration between different agencies within your jurisdiction, such a Public Works or Health Department?
    a. If so, please explain this collaboration.
16. Have you found it necessary to provide extensive staff training to implement your green building program?
    a. If so, how many staff members received training, what type of training did they receive, and through what organization did they conduct this training?
17. Do you have a section or division dedicated solely to green building guidelines and compliance?
18. How has your green building program been received by the private sector?
19. How has your green building program been received by your staff?
20. Does your jurisdiction provide incentives for building green, such as priority plan check or reduced processing fees, expedited permits, grants/loans, financial incentives, technical assistance??
21. Have you provided training for the developers, architects, contractors, and maintenance personnel in you area?
22. Are there policies in your General Plan that support green building construction and renovation?
23. Have you incorporated green building development standards into your Zoning Code?
24. Have you amended the Subdivisions Code to address such issues as solar orientation, dual plumbing and landscaping?
25. What are some challenges you have encountered, either in implementation or with the public?
26. Any advice for jurisdictions just getting started with developing green building programs?
27. Are you aware of Low Impact Development (LID) as a means to manage stormwater? Have LID strategies been incorporated into your building guidelines? LID is an ecosystem-based approach that seeks to maintain the built environment as a functioning part of an ecosystem rather than apart from it.
28. If using another type of program, what types of green modifications do you require?
29. Do these initiatives include site design (solar orientation, hillside development, landscaping), reclaimed water usage, building materials, etc…?

APPENDIX D, Resources

Alameda County Waste Management Authority, web site. http://www.stopwaste.org/home/index.asp?page=1
Borrego Solar, web site. http://www.borregosolar.com/.
City of Berkeley, Office of Energy and Sustainable Development, web site. http://www.ci.berkeley.ca.us/sustainable/
Brownstein, Ronald. 2006. Local Governments Get Serious About the Environment. *Los Angeles Times Online,* 1 October.
CH2M Hill, Seminar: Low Impact Development Principles and Implementation—A Hands-on Approach, June 15, 2007.
City of Calabasas, Planning and Environmental Programs Division, web site. http://www.cityofcalabasas.com/departments/planning-division.html
City of Chicago, IL, Department of Planning and Development, web site. http://www.cityofchicago.org/city/webportal/portalDeptCategoryAction.do?BV_SessionID=@@@@@1623832183.1176226959@@@@@&BV_EngineID=cccdaddkikljfdkcefecelldffhdfhg.0&deptCategoryOID=536890773&contentType=COC_EDITORIAL&topChannelName=Dept&entityName=Planning+And+Development&deptMainCategoryOID=-536884767
City of Cotati, Sustainable Building Program, web site. http://www.ci.cotati.ca.us/sections/departments/sustainable-building-program.cfm
Hofmann, Michelle. 2007. Surprise, it's solar. *Los Angeles Times*, June 3.
Kats, Gregory. 2006. *Greening America's Schools: Costs and Benefits*.
City of Los Angeles, Environmental Affairs Department, web site. http://www.ci.la.ca.us/EAD/
City of Pasadena, Green Building Program, web site. http://www.ci.pasadena.ca.us/permitcenter/greencity/building/gbprogram.asp
City of Pasadena, Green City Action Plan, web site. http://www.ci.pasadena.ca.us/permitcenter/GreenCity/GreenActionplanWeb.pdf
City of Portland, OR, Office of Sustainable Development, web site. http://www.portlandonline.com/osd/index.cfm?c=41481
City of Portland, OR, G/Rated - Green Building Program, web site. http://www.portlandonline.com/osd/index.cfm?c=42248&a=126515
City of Santa Monica, Environmental Programs Division, web site. http://greenbuildings.santa-monica.org/index.html
City of Scottsdale, AZ, Green Building Program, web site. http://www.scottsdaleaz.gov/greenbuilding/
City of Seattle, WA, Office of Sustainability, web site.http://www.cityofseattle.net/dpd/GreenBuilding/
U.S. Green Building Council. 2007. USGBC Testifies Before the U.S. Congress about Green Building An Overlooked Solution to Reducing U.S. Energy Consumption, web site. http://www.usgbc.org/News/USGBCInTheNewsDetails.aspx?ID=2653. 23 May.
City of West Hollywood, Planning Department, web site. http://www.weho.org/index.cfm/fuseaction/nav/navid/58/

ATTACHMENT E

Low Impact Development for the Unincorporated Areas of Los Angeles County

Low Impact Development

For the Unincorporated Areas of Los Angeles County

Report and Recommendations

The County of Los Angeles
Department of Regional Planning
Department of Public Works

October, 23 2007

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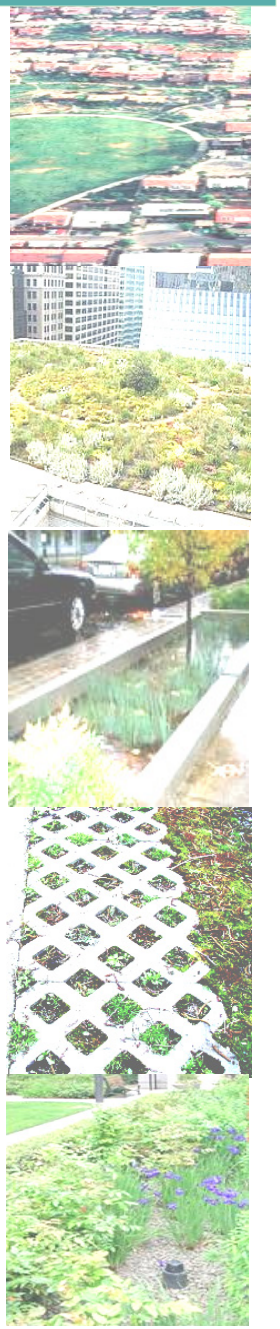


I. SUMMARY AND RECOMMENDATIONS

LID aims to protect surface and ground water quality, maintain the integrity of aquatic living resources and ecosystems, and preserve the physical integrity of receiving streams.

On January 16, 2007, the Los Angeles County Board of Supervisors instructed the Directors of Public Works and Planning to investigate and report back with recommended changes to the zoning and subdivision ordinances incorporating Low Impact Development standards for new development projects. The Board also directed the Director of Public Works to include in the report back an analysis of the feasibility of incorporating LID standards into all future road and flood control infrastructure projects.

Low Impact Development (LID) is a stormwater management system and a critical component of site sustainability. LID aims to protect surface and ground water quality, maintain the integrity of aquatic living resources and ecosystems, and preserve the physical integrity of receiving streams by controlling rainfall and storm water runoff at the source. Unlike traditional stormwater management techniques that utilize drains and channelized networks to drain impervious surfaces and quickly direct water off a project site, LID Best Management Practices (BMPs) distribute storm water throughout a project site in order to replenish groundwater supplies, clean runoff, and allow land to be developed in an environmentally responsible manner. LID practices also conserve water, improve human health, reduce the quantity and improve the quality of runoff, recharge local groundwater supplies and cost less to maintain and operate, making them a highly cost-effective way to immediately make dramatic reductions in greenhouse gas emissions.

Vegetated Swale
Portland, OR

The County has already shown a commitment to incorporating LID-type Best Management Practices and will continue to**:**

1. Work with consultants on the General Plan Update and Zoning Ordinance Update to incorporate LID concepts.
2. Direct all applicants submitting Environmental Impact Reports under the California Environmental Quality Act to discuss the implementation of proposed Low Impact Development standards as mitigation measures.
3. Condition the incorporation of LID practices for certain projects.
4. Require a minimum 70% open space within non-urban hillside management areas of the County.
5. Require planting of on-site trees within proposed subdivisions.
6. Require commercial parking lots to have a minimum 2% landscaped area.
7. Require erosion and sediment control measures.
8. Require the preparation, enforcement, and inspection of all local and State Storm Water Pollution Prevention Plans.
9. Require construction and post-construction phase stormwater Best Management Practices.

Village Homes
Davis, CA

The proposed recommendations for further incorporating LID practices for new development and redevelop-

ment within the County include amending Title 21 Subdivision Code and Title 22 Planning and Zoning Code within the next two years to incorporate standards requiring dispersed, on-site, post-construction stormwater BMPs when feasible. Guidance documents and manuals will be created based on the amended Codes. Standards will also be written for the incorporation of LID-type BMPs into County road and storm drain projects wherever feasible.

The proposed recommendations summarized in Table 1 are the result of collaboration between the Department of Regional Planning and the Department of Public Works.

II. LOW IMPACT DEVELOPMENT

Low impact development practices can most easily be implemented for new development. Major redevelopment is also a candidate for at least some of the elements of low impact development, namely rainfall interception, depression storage, filtration and evapotranspiration. Infiltration may or may not be practical for redevelopment projects, depending on proximity to unprotected foundations, suitable porous soil types, adequate depth to ground water, and geological concerns.

Green Streets
Portland, OR

Retrofitting of the already built environment with LID practices is probably the biggest challenge; however, some on-site BMPs such as rainfall interception, depression storage, filtration and evapotranspiration could be incorporated into the built environment under a number of situations, especially with the desire to "green" Los Angeles.

TABLE 1

COUNTY OF LOS ANGELES
DEPARTMENTS OF REGIONAL PLANNING AND PUBLIC WORKS
LOW IMPACT DEVELOPMENT (LID)
RECOMMENDATIONS AND REQUESTS TO THE BOARD OF SUPERVISORS

1	**Ongoing**	Work with public agencies and stakeholders to identify the most effective CEQA mitigation measures and development conditions of LID development standards and incorporate them into comments on environmental documents.
2	**April 2008**	Standardize the incorporation of LID guidelines for conditioned projects by the Hearing Officer, Regional Planning Commission, and/or the Board of Supervisors. • Include LID guidelines for project design within all zoning and subdivision application packets for discretionary reviews. • Include LID design criteria within the Subdivision Committee review process. • Address compliance with LID standards within the findings and conditions prepared for all discretionary permits.
3	**2009-2010**	Incorporate LID standards into Road and Flood Design and Maintenance Manuals
4	**March 2008**	DRP to amend Title 22, Planning and Zoning Code, to require planting of new shade trees for all single lot residential development, increase the number of trees required in parking lots, including rooftop parking areas.
5	**July 2008**	DRP to amend Title 22, Planning and Zoning Code, to broaden requirements for landscaping parking lots to include a greater number of trees and explore the feasibility of applying this to rooftop parking.
6	**October 2008**	Identify LID program costs and cost-recovery mechanisms.
7	**Ongoing**	DRP and DPW to develop a website and pamphlets available at the public counters of the Departments of Regional Planning and Public Works explaining Low Impact Development benefits, construction techniques, and requirements.
9	**2009 +**	Work with stakeholders, including private industry, nonprofit organizations, other governmental entities, and regulatory agencies to determine the effectiveness of LID standards.

The Low Impact Development (LID) concept originated as a stormwater management system developed by Prince George's County, MD, Department of Environmental Resources. The BMPs are non-proprietary for the most part and look like ordinary garden amenities. As such, they can blend in with a site's landscaping, often enhancing a development's value. The concept of low impact development and distributed BMPs differs from the current design practice of end-of-pipe treatment utilizing stormwater ponds and proprietary BMPs.

The LID design process is broken down into five elements: site planning, hydrologic analysis, integrated BMPs, erosion and sediment control, and public outreach.

Growth and development will continue in Los Angeles, both in the undeveloped and developed portions of the County. If not planned and executed correctly, growth can bring with it unfavorable impacts to the natural environment. Common undesirable impacts are the changes brought upon water bodies from runoff due to pollution and increased volume. For example, the Los Angeles River, Ballona Creek and Malibu Creek are impaired by toxicity, bacteria, and manmade trash.

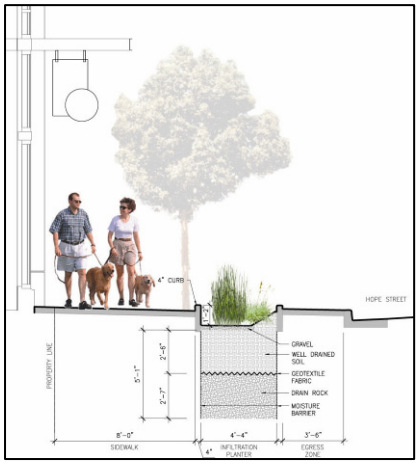
Vegetated Swale
Village Homes in Davis, CA

LID is also a critical component in the overall sustainability of a site. Skillfully managing stormwater and urban runoff to be maintained onsite has two major benefits. First, reduction of runoff entering waterways reduces erosion, sediment build-up and pollution entering the waterway; helping to maintain the integrity of aquatic living resources and ecosystems and preserving the physical integrity of receiving streams by controlling rainfall and stormwater runoff at the source. Second, on-site infiltration and storage of rainfall to be reused on-site, or infiltrated back into the water table are means to reduce imported water and

the energy required to import it.

In addition to this report's recommendations for early and future opportunities to implement LID for LA County, Public Works is a voluntary member of the Southern California Stormwater Monitoring Coalition, a research group comprised of the local Regional Boards and local "principal" stormwater permittees. A current project just started by the coalition, and one in which Public Works is participating, is the development over a five-year period of a model LID program for Southern California. The effort will determine key technical and institutional issues for LID application, build and test pilot LID-type BMPs, and train agencies on LID implementation strategy.

Permeable Paving



Urban Street Biofilter
South Park Development, Los Angeles
Calvin Ahbe Landscape Architects

Low Impact Development requirements are also being proposed in the draft Municipal Stormwater Permit for Ventura County, which immediately precedes and will be similar to the permit the Regional Board will draft for Los Angeles County. Therefore, LID measures are expected to be required in the next LA County permit.

LID Principles

LID seeks to achieve stormwater control through the creation of a hydrologically functional landscape that mimics the natural, predevelopment conditions. Hydrology is the science related to the relationships of rainfall, infil-

LID seeks to achieve stormwater control through the creation of a hydrologically functional landscape that mimics the natural, predevelopment conditions.

tration, evaporation, transpiration, and the flow of water on and below the earth's surface. When land is altered from its natural state, as impervious surfaces are built and connected, as slopes are modified, as runoff is channelized, and as human activities intensify, the characteristics of runoff quantity and quality change. LID minimizes these stormwater quantity and quality impacts by managing runoff on-site so that post-development conditions resemble the predevelopment conditions. Pollution prevention at the source is widely believed to be more cost effective than treatment at the end of the storm drain.

LID Practices
Riverside Stewardship Alliance

LID principles are applicable to public as well as private development and are most easily applied in situations of new development, where previously undeveloped land is converted to a different land use. Land that is already developed but undergoing redevelopment, including infill development, could also benefit from the application of as many post-construction source control LID-type BMPs as possible. Post-construction LID-type BMPs, such as parkway, median, and catch basin bioretention, can also be incorporated into road and storm drain construction in some circumstances. The biggest challenge involves retrofitting post-construction LID-type BMPs into existing development that meets all current design criteria but is not slated for redevelopment.

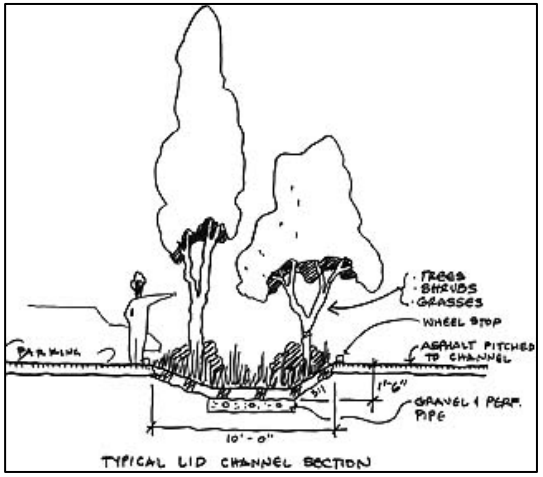
Infiltration islands in parking lots can help reduce stormwater runoff

LID seeks to achieve stormwater control through the creation of a hydrologically functional landscape that mimics the natural, predevelopment conditions by:

- Reducing the amount of runoff by providing runoff storage measures

dispersed uniformly throughout a site's landscape with the use of a variety of infiltration, detention, retention, and runoff practices.

- Directing runoff from a variety of surfaces, including roofs, parking lots, and other impervious surfaces, to either distribute water into the ground or to collect it for reuse.
- Disconnecting impervious surfaces in order to slow and infiltrate runoff.
- Strategically routing flows to maintain predevelopment travel time and control the rate of discharge.
- Cleansing runoff by routing it through vegetated conveyances and filtering it through bioretention systems.
- Implementing effective public education programs to encourage property owners to use pollution prevention measures and maintain the on-lot hydrologically functional landscape management practices.



Typical LID Cross-Section
AHBL, WA

Hydrology

LID Street

Throughout the LID site development process, hydrology is considered and integrated as a key design element. Site planning seeks to limit directly contiguous impervious surfaces, reduce/minimize imperviousness, limit clearing and grading, control stormwater at its source, and protect natural drainage features. Small lots and clustered development are exam-

ples of LID site planning strategies. Hydrologic analysis considers land cover type, soil type and texture, and antecedent soil moisture conditions to determine the appropriate techniques and designs to reduce runoff and maintain the predevelopment time of concentration. After site-planning techniques have been exercised and hydrologic analysis conducted, integrated BMPs are used to provide additional hydrologic control of peak discharge and runoff volume. BMPs are strategically located on the lot and may include bioretention facilities, dry wells, filter/buffer strips and other multifunctional landscape areas, grassed swales, bioswales, rain barrels, cisterns, and infiltration trenches. On-site bioretention devices look for all practical purposes like gardens and have thus earned the name "rain gardens." For landscaping and buffering, the use of native plants, which are acclimatized to periods of heavy rain and prolonged drought, fits into the integrated BMP strategy.

Bioretention rain gardens in a residential subdivision

Erosion and Sediment Control

LID considers erosion and sediment control throughout the planning, scheduling of operations, and maintenance of a development. LID employs a variety of techniques, including natural vegetation, runoff control, vegetated buffers, and sediment traps or basins to control erosion and sediment. Erosion and sediment control practices are requirements for new development and redevelopment under both the Los Angeles County Municipal Stormwater Permit and the State Board's Construction Storm Water General Permit. Both permits regulate construction BMP practices for private and public construction in the County. These requirements are expected to continue into future generations of stormwater permits.

Public Outreach

An outreach program directed to property owners informs them of the benefits associated with low impact development design, reminds them of their participation in the stormwater management process by maintaining the BMPs situated on their property, and thereby reduces the maintenance burden on public agencies.

III. METHODOLGY

Staff has taken several steps in preparing the recommendations for incorporating Low Impact Development practices, including analysis of the existing County Code, a cross-jurisdictional survey of green building programs, review of existing third-party standards, guidelines and rating systems, and stakeholder outreach.

A. Analysis of Existing County Code Regulations and Policies

The original concept behind LID was developed in Prince George's County, MD. The Prince George's County guidance manual for LID design broke the design process down into five elements: site planning, hydrologic analysis, integrated BMPs, erosion and sediment control, and public outreach. The following tables summarize the modifications the County of Los Angeles could take to adopt a program similar to the Prince George County model:

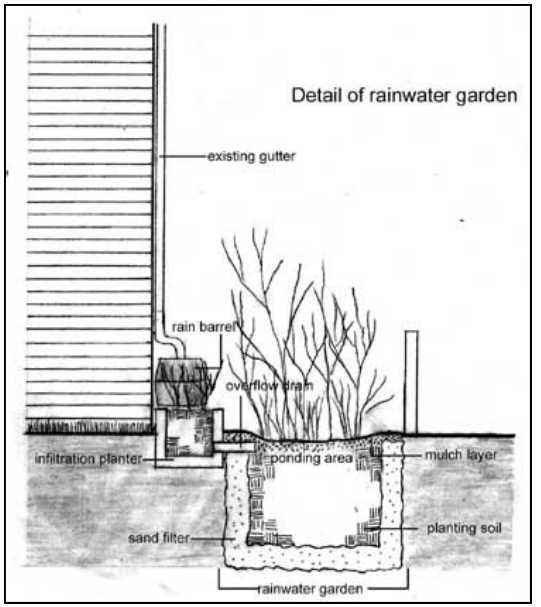
LID Parking Lot
Environmental Services Building
Pierce County, WA

New rain garden on single family lot

Site Planning

Goal: The overall goal is to mimic the natural hydrologic functions of the project site while allowing for full development of the property. The post-development hydrology (or flow of water) of a project site should be the same as the pre-development hydrology. Ideally, development should contribute zero net impacts to offsite stormwater flow. Hydrologic goals and objectives should be incorporated into the site planning process as early as possible.

Purpose: achieve stormwater management goals and objectives; facilitate the development of site plans that are adapted to natural topographic constraints; maximize lot yield (or number of proposed lots); maintain site hydrologic functions; and provide for aesthetically pleasing, cost effective stormwater management controls.



Detail of Rainwater Garden

Site Planning

LID ELEMENT	EXISTING PROVISION	OPPORTUNITIES
Use hydrology as the integrating framework: Preserve sensitive areas that affect the hydrology, including streams and their buffers, floodplains, wetlands, steep slopes, high-permeability soils, and woodland conservation zones. Evaluate potential site layout and development schemes to reduce, minimize and disconnect the total impervious area at the site.	Title 21 (Subdivision Ordinance): 21.24.250 and 21.24.260 permit reduced lot sizes due to sloping terrain, 21.24.360 allows alternate requirements Title 22. (Zoning Ordinance) 22.44 and 22.56.215 establish regulations on preservation of creeks and ridgelines and native vegetation	This allows for the preservation of sensitive areas associated with steep topography. Smaller lot sizes would also promote smaller building pad areas, which would reduce overall impervious surface area.
Decentralization: Rather than dealing only with peak flows and large watersheds, consider parcels as watersheds ("microsubsheds"), design for small, more frequent storms, think small regarding the size of control practices ("microtechniques"), and distribute the controls throughout the entire site.	Current policy does not encourage decentralization	Consider policies and practices that encourage distributed site-specific stormwater control
Utilization of simplistic, non-structural methods: For stormwater management, utilize features such as native plants, soil and gravel (instead of engineered conveyances using concrete and steel).	Some Community Standards Districts encourage or mandate the use of natural materials in flood control conveyances wherever possible	Consider further ordinances, practices and policies that encourage utilization of systems that mimic natural functions
Create a multifunctional landscape and infrastructure: Urban landscape or infrastructure features (roof, streets, parking, sidewalks, and green space) can be designed to be multifunctional, incorporating detention, retention, filtration, or runoff use.	Title 21 (Subdivision Ordinance): 21.32.160 requires subdividers to plant street trees of a number, species and location to be determined by the road commissioner. Title 21 (Subdivision Ordinance): 21.32.170 requires the director of Parks and Recreation to advise any subdivider so required in the selection and care of trees and shrubs for planting strips to be reserved on the subject property. Title 21 (Subdivision Ordinance): 21.32.195 requires developers to plant onsite ("front yard") trees subject to the approval of the director or Regional Planning.	Enough flexibility exists in this current provision to implement LID standards for urban infrastructure, such as bioretention cells. Tree canopies and planting beds associated with subdivision improvements can be designed to promote LID functions such as infiltration of runoff, groundwater recharge and pollutant removal. Regarding the onsite trees: Instead of allowing the developer to plant trees at any onsite location, the County could require the developer to integrate the trees into a landscape and hydrology plan supporting LID functions described above. Consider increasing the amount of required planting.

LID Hydrology

Goal: The goal is to preserve or restore the hydrologic functions of watersheds.

Purpose: maintain post-development runoff rate, volume, time of concentration, and quality to pre-development conditions.

LID ELEMENT	EXISTING PROVISIONS	OPPORTUNITIES
Match post-development peak flow rates off the property to pre-development conditions for a range of storms.	Current practice requires that major infrastructure be designed to convey runoff from the 50-yr design storm. In the urban environment, the combination of streets and drains must safely convey the runoff from a 25-yr rainfall and post-development peak flow rates must not exceed the downstream receiving system's capacity. Under specific development conditions in specific geographic areas, the post-development runoff from a 2-year or 50-year storm must not exceed the pre-development runoff rate.	Maintain the current peak flow criteria pertaining to the 50-yr design storm for major infrastructure and the 25-yr storm for urbanized areas. _____ Adopt hydrologic design standards for new development and redevelopment that accurately model LID practices for small, more frequent storms. _____ Adopt drainage design standards that require the disconnection of impervious surfaces and less use of on-site "hard" conveyance systems.
Match postdevelopment runoff volumes off the property for small, more frequent storms to predevelopment conditions.	Current practice requires the infiltration of runoff, if flow-through treatment is not provided, for specific "priority" projects according to SUSMP regulations, most commonly from a ¾" rainfall.	Adopt hydrologic design standards that accurately model runoff volumes for LID practices from small, more frequent rainfall conditions. _____ Adopt drainage design standards that require on-site infiltration wherever practicable, bioretention, and evapotranspiration.
Match postdevelopment runoff durations for small, more frequent storms to pre-development conditions.	Current practice does not require matching post-development runoff durations to pre-development levels.	Adopt hydrologic and drainage design standards for LID practices that require the interception of rainfall and the slowing of on-site runoff via the flattening and "softening" of conveyances and the disconnection of impervious surfaces.
Control stormwater quality for small, more frequent storms.	Current practice requires the flow-through treatment of runoff, if infiltration is not provided, for specific "priority" projects according to SUSMP regulations, most commonly from the 85^{th} percentile storm.	Adopt hydrologic and drainage design standards that model LID practices for small, more frequent rainfall conditions and allow more opportunities for on-site infiltration wherever practicable, bioretention, and evapotranspiration.

Integrated BMPs

Goal: The goal is to integrate stormwater BMPs into a development project's design in order to compensate for the increased impervious and change of land use in order to mimic the predevelopment hydrologic regime of the site.

Purpose: reduce the volume, peak flow, and runoff pollution conditions after development, distribute maintenance costs among the property owner, decrease costs to the County of property acquisition due to a decreased need for structural stormwater controls.

LID ELEMENT	EXISTING PROVISIONS	OPPORTUNITIES
Bioretention Facilities A practice to manage and treat stormwater runoff by using an engineered planting soil bed and planting materials to filter runoff stored within a shallow depression.	Current practice allows for inclusion of bioretention facilities in new development on a case-by-case basis provided the designer can substantiate the facility's performance.	Adopt design and usage standards with stakeholders for bioretention facilities for new development, redevelopment, and retrofit circumstances.
Dry Wells A small excavated pit backfilled with gravel or stone to receive roof runoff. Treatment is accomplished by adsorption, trapping, filtering, and bacterial degradation.	Current practice allows for inclusion of dry wells in new development on a case-by-case basis provided the designer can substantiate the dry well's performance.	Adopt design and usage standards with stakeholders for dry wells for new development, redevelopment, and retrofit circumstances.
Filter/Buffer Strips Bands of closely growing vegetation, usually grass, planted between pollutant source areas and a water body or environmentally sensitive area, commonly used as a pretreatment device with other BMPs.	Current practice allows for inclusion of filter strips and buffer strips in new development on a case-by-case evaluation provided the designer can substantiate the strip's performance.	Adopt design and usage standards with stakeholders for filter strips and buffer strips for new development, redevelopment, and retrofit circumstances..
Grassed Swales Convey runoff away from roadways and rights-of-way.	Current practice allows inclusion of grassed swales in new development on a case-by-case basis provided the design can substantiate the conveyance's performance.	Adopt design and usage standards with stakeholders for grassed swales for new development, redevelopment, and retrofit circumstances.
Rain Barrels Above-ground, low cost retention devices that primarily store rooftop runoff.	Current practice usually does not allow rain barrel usage on private property.	Adopt design and usage standards with stakeholders for rain barrels for new development, redevelopment, and retrofit circumstances.
Cisterns Storage tanks that primarily store rooftop runoff for infiltration or later reuse.	Current practice will allow inclusion of cisterns in new development on a case-by-case basis provided the designer can defend their performance.	Adopt design and usage standards with stakeholders for cisterns for new development, redevelopment, and retrofit circumstances.
Infiltration Trenches An excavated open trench back-filled with stone that stores water for slow release into the soil, usually coupled with a pretreatment BMP.	Current practice allows for inclusion of infiltration trenches in new development on a case-by-case basis provided there is adequate clearance from unprotected foundations and depth to seasonal high groundwater and designer can defend performance.	Adopt design and usage standards with stakeholders, inc. foundation protection, adequate clearance, and depth to seasonal high groundwater, for infiltration trenches for new development, redevelopment, and retrofit circumstances.
Other On-Site BMP Technology New and developing proprietary and nonproprietary technology, such as porous pavements, "smart" irrigation controllers, pop-up emitters, green roofs and other devices designed to mitigate stormwater flow, volume, and quality.	Current practice allows for inclusion of various on-site BMPs in new development on a case-by-case basis provided the designer can substantiate the technology's performance and verify its safety.	Adopt design and usage standards with stakeholders for source control BMPs for new development, redevelopment, and retrofit circumstances.

Erosion and Sediment Control

Goal: The goal is to prevent erosion on the development site and eliminate the sedimentation that can occur during and after construction.

Purpose: minimize the amount of land cleared at any particular time, phase construction, prevent soil erosion, control the deposition of sediment, resolve problems before they cause harm.

LID ELEMENT	EXISTING PROVISIONS	OPPORTUNITIES
Planning Plan the construction operation to fit the existing site features.	DPW enforces the current MS4 permit in requiring the preparation of a local Stormwater Pollution Prevention Plan (SWPPP) for all private construction activity in the County. DPW also enforces the current General Construction Permit in requiring the preparation of a State SWPPP for all private construction activities ≥ 1 acre. DPW oversees the preparation of SWPPPs for all County construction. SWPPPs address slopes, natural drainage paths, soil erodability, and natural vegetation. SWPPPs identify potential construction-related pollutant sources, identify non-stormwater discharges, and require the use of BMPs to prevent construction-related pollution from entering the storm drain system.	Continue the preparation, enforcement, and inspection of all local and State SWPPPs.
Scheduling of Operations Minimize the extent and duration of exposed soils during construction. Preferably schedule earthmoving and grading operations during the dry season or dry periods.	DPW encourages exposing the smallest practical area of land for the shortest possible time for private and public development construction projects.	Continue current construction scheduling practices.
Controlling Soil Erosion Employ soil erosion controls at the source during construction as a first line of defense.	DPW encourages the use of preventative soil stabilization and runoff control practices on exposed soils wherever possible for private and public development construction projects.	Continue current soil erosion control practices.
Controlling Sediment Employ sediment controls at the construction site as a second line of defense against off-site damage.	DPW requires the use of BMPs to prevent eroded soil particles from leaving the disturbed area and reaching the street, storm drain, or receiving water for private and public development construction projects.	Continue current sediment control practices.
Inspection and Maintenance Inspect, maintain, and repair all erosion and sediment controls before, during, and after development.	DPW enforces the maintenance of private development construction practices through periodic inspection. DPW requires the developer/contractor to conduct self-inspections before, during and after storm events. DPW inspects and enforces maintenance of County development construction projects.	Continue current inspection and maintenance practices.

Outreach

Goal: The goal is to educate developers, buyers, designers, builders, plan checkers, property owners, and the general public on LID practices and benefits.

Purpose: incorporate LID practices into new development, redevelopment, and existing development, distribute maintenance costs among the property owners, and reduce the scale of maintenance costs to levels affordable to the property owner.

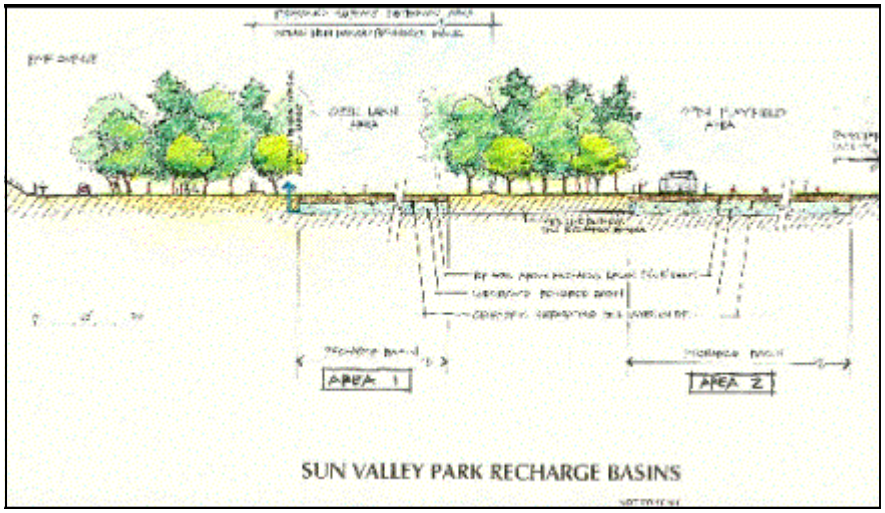
LID ELEMENT	EXISTING PROVISIONS	OPPORTUNITIES
Define Public Outreach Program Objectives: create marketing tool for developers to attract environmentally conscious buyers; promote stewardship of natural resources; promote more aesthetically pleasing development; educate property owners on effective pollution prevention practices and potential cost savings of LID practices; encourage a greater sense of community; ensure proper maintenance of integrated BMPs	DPW currently conducts, through contracts, outreach programs related to the Municipal Stormwater Permit, solid waste reduction, reuse, and recycling.	Modify MS4 and solid waste contracts to include LID program outreach. Incorporate "rain gardens" information and techniques into the Smart Gardening program. Incorporate LID standards and practices into the Smart Gardening workshops for residents and advanced workshops on water-wise landscape design. Incorporate LID practices and associated signage in the design of additional Learning Centers planned for 2009. Augment current Stormwater Public Information and Participation Program (PIPP) public outreach efforts in the areas of paid advertising campaigns, media relations efforts, and BMP training for restaurant and gasoline stations to include LID practices.
Identify Target Audiences: potential buyers, designers, plan checkers, builders, site managers, new property owners, existing property owners, industrial and commercial property owners.	Under current outreach contracts, DPW targets audiences for various special studies and surveys.	Modify MS4 and solid waste outreach contracts to target LID audiences.
Develop Outreach Materials: brochures, manuals, fact sheets, training sessions, and other assets.	Under current contracts, DPW produces specialized outreach materials for target audiences.	Modify MS4 and solid waste contracts to include LID outreach assets for the target audiences. Add to the current offering of Stormwater Public Information and Participation Program (PIPP) campaign collateral on various pollution prevention topics, a tip card for the general public on LID practices for residential use. Develop outreach materials through the Smart Gardening Program
Distribute Outreach Materials: make materials available at several points in the property transfer process.	DPW makes materials available electronically, through cable productions, through radio and TV PSAs, and in printed version at public counters.	Expand current outreach media where necessary to reach target audiences. Develop additional pages for the Program's SmartGardening.com website to promote LID to residents, gardeners/landscapers, and developers. Develop information on LID to add under the stormwater program on 888CleanLA.com and add a taped message to the (888)CLEAN LA toll-free hotline. Review augmentations to current public outreach efforts in the areas of paid advertising campaigns, media relations efforts, and BMP training for restaurant and gasoline stations to include LID.

B. Stakeholder Outreach and Experience

Los Angeles County has joined Chicago, Portland, Seattle and Santa Monica in implementing innovative stormwater management programs that utilize on-site LID-type BMPs. Though not necessarily called Low Impact Development, these programs address and include many of the elements of a LID system for managing stormwater runoff. The following summarizes the basic elements of the programs in Los Angeles County, and those in Chicago, Portland, Seattle, and Santa Monica:

- **Los Angeles County**: Our programs have included clustering of development, infiltration basins, dry wells, bio swales and basins, and smart irrigation. For example, the County has been actively working with Newhall Ranch, the largest development underway in Los Angeles County. This development consists of 20,885 residential units and over 5.5 million square feet of commercial/industrial development. Approximately 70% (8,335 acres) of this project will remain undeveloped open area. This development will be incorporating LID features in an effort to mimic the natural hydrologic conditions. These features include: minimizing impervious areas and maximizing permeability, conservation of natural areas, and protecting slopes and channels. In this development, the County will also be implementing modified street/ neighborhood design, which encourages pedestrian travel and decreases impervious street surfaces; increasing setbacks from significant drainage courses in order to convey post-development flows in a natural manner.

Sun Valley Park



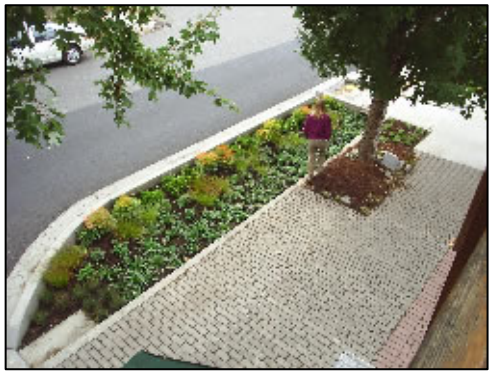
Sun Valley Park Recharge Basins

In addition, the County's Sun Valley Watershed Management Project was designed to address a major flooding problem using LID best management practices of infiltration, peak flow reduction, bioswales, water quality treatment and reuse, rather than constructing a traditional storm drain. Public Works is also developing project concepts for retrofitting County roadways with vegetated swales to filter and conserve stormwater and urban runoff.

- **Chicago**: New stormwater ordinance was just adopted, effective in early 2008, that requires all projects over 15,000 ft^2 must keep a minimum of ½" of rain on site or make the development 15% more permeable than pre-development conditions. Applicants must submit a stormwater management plan on how they will achieve this. The city is currently in the process of establishing guidelines and developing an on-line calculator to help applicants determine compliance.

Green Roof
City Hall, Chicago, IL

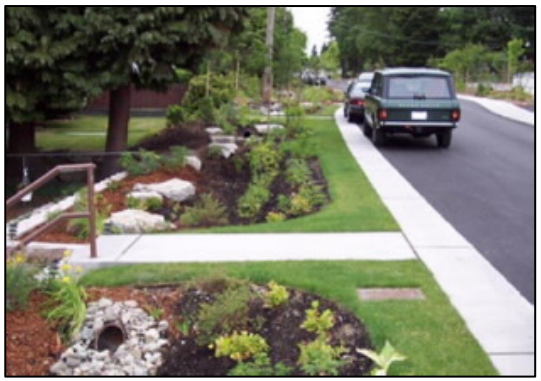
- **Portland**: The City provides extensive strategies, guidelines and educational tools (all available online) for managing runoff, including ecoroofs (vegetative or green roofs),



Green Street
Portland, OR

rainwater harvesting (rain barrels and cisterns), bioswales (vegetative ditches that collect rainwater), and green streets that manage runoff on the surface and at its source. The city also offers a Community Watersheds Stewardship Grant program with goal of raising awareness and improving watershed health through community project grants, educational workshops, technical assistance, watershed council organizational development and informational resources. The program provides up to $5,000 to schools, churches, and other community organizations for projects that protect and enhance watershed health at the local level.

- **Seattle**: Since 1999, Seattle Public Utilities' (SPU) natural drainage systems program has taken an innovative approach to street design in order to reduce the negative impacts of stormwater runoff into creeks, lakes, and bays. The City calls them Street Edge Alternatives, or SEA streets. The enlargement of the street parkway incorporates vegetated swales and reduces the street's imperviousness by 11 percent. SPU has completed five projects - ranging in scale from the retrofit of a single residential block to the complete redevelopment of 129 acres of mixed-income housing. New projects in development include a downtown LID application and a LID retrofit of another sub-watershed in north Seattle.



LID Street,
Seattle, WA

- **Santa Monica**: The City, also a permittee under the Los Angeles County Municipal Stormwater Permit**,** requires that all new developments and substantial remodels prepare an Urban Runoff Mitigation Plan to

insure that each new development maximizes permeable surface area and minimizes the amount of runoff that is directed to impermeable areas. At least one of the following elements must be implemented: limit the impervious area of the total surface area; incorporate structural Best Management Practices that are found to be beneficial to the prevention of stormwater pollution (oil/water separators, catch basin inserts, sand filters, detention basins, ponds, vaults, trenches, dry wells, roof downspout infiltration, porous pavement, grid pavers, grass swales and strips, etc.); design timing and application methods of irrigation systems to minimize the runoff of excess water into the storm drain system; or achieve long-term soil stabilization by permanent growth of native vegetation. The City also offers grants for stormwater mitigation systems, covering 50% of the system up to $5000.

Other Stakeholders' Experiences:

In our research of stakeholder experiences, we found some negative, but mostly positive opinions and experiences regarding LID regulations.

Negative Opinions and Experiences

- The Construction Industry Coalition on Clean Water and the Building Industry Association of Southern California, in a letter to the Los Angeles Regional Water Quality Control Board on March 7, 2007 jointly made the following comments and claims regarding the proposed LID regulations in the draft Ventura County MS4 Permit:
    - ◊ There is no evidence that on-site infiltration or LID practices are necessary to prevent water quality impacts.
    - ◊ There is no evidence that on-site LID practices are more effective than regional BMPs for con-

trolling impacts due to increased runoff volume.

- ◊ On-site LID BMPs may prevent regional BMPs that benefit existing untreated development runoff.
- ◊ For sites that discharge to engineered channels, large lakes, bays and estuaries, volumetric (hydromodification) BMPs will not be cost effective. Costs for hydromodification BMPs are particularly ineffective for infill and retrofit projects in these situations.
- ◊ LID is technically infeasible under certain conditions, such as new development at small infill sites, most redevelopment, nonporous soils, infiltration restrictions, and high or contaminated groundwater.
- ◊ LID requirements impair the growth of housing, and therefore the need for housing should be taken into account when imposing LID standards.
- ◊ Imposing LID requirements on a single redeveloped lot in an urban setting will not substantially improve overall water quality.

Positive Opinions and Experiences

- According to the National Association of Home Builders' ToolBase Services web site:
  - ◊ Low Impact Development (LID) techniques can offer developers a more cost effective way to address storm water management through site design modifications and "Best Management Practices" (BMPs). These strategies allow land to be developed in an environmentally responsible manner to create a more "Hydrologically Functional" landscape.
  - ◊ Low Impact Development (LID) strategies strive to allow natural infiltration to occur as close as possible to the original area of rainfall. By engineering terrain, vegetation, and soil features

to perform this function, costly conveyance systems can be avoided, and the landscape can retain more of its natural hydrological function. Low Impact Development practices dovetail with "green" building practices that incorporate environmental considerations into all phases of the development process. Builders can often use green building and LID to lower actual development costs. Although most effective when implemented on a community-wide basis, using LID practices on a smaller scale, i.e., on a small development, can also have an impact.

- ◊ LID design principles can be used as buffers to filter (spilled oil, detergents, solvents, de-icing salt, pesticides, fertilizer, and bacteria from pet waste) before they reach aquifers.
- ◊ LID … should be more than just new storm water technologies for single lots. LID should be about looking at water resources in a holistic, watershed-based manner, and effectively managing such resources. Such an approach involves conserving water inside and outside a house, using decentralized storm water management BMPs for single lots and larger-scale developments, identifying the best ways to handle wastewater, and addressing storm events as required.

- Builder's experience (Bielinski Development, Waukesha, WI, at Chesterfield County, VA, LID Conference, 1998):
  - ◊ Nature sells
  - ◊ The biggest obstacle to low impact development is ordinances
  - ◊ While additional design work adds up-front costs, infrastructure reduction offsets them
  - ◊ Approvals add time, and time is money
  - ◊ Some communities are embracing the concept of LID and working toward streamlining approvals

- ◊ Leadership is needed from elected officials, planning/zoning boards, municipal staff, developers, and regulatory agencies for LID to succeed
- The added value of LID design results in: lot premiums, increased sales velocity, increase sales volume, reduced debt service, reduced infrastructure costs

LID includes maintaining natural waterways
Tuna Canyon, Santa Monica Mountains

- Case Study: Madera Subdivision, Gainesville, FL, 2004
  - ◊ Developer: Green Trust, LLC (MD) in partnership with the University of Florida Energy Extension Office, Glenn Acomb, Dept. of Landscape Architecture
  - ◊ Size: 44 acres
  - ◊ Particulars:
    - . First to be approved under Gainesville's Green Development Code
    - . 88 single-family (2200 – 2400 sq. ft. typical) homes on 44 acres
    - . Limited clearing of lots, existing tree locations submitted with site plans
    - . Vegetation mostly native plants with very limited (35% of conventional) turf usage
    - . Limited irrigation (50%), low volume design
    - . Limited impervious cover (encouraged)—pervious pavers for driveways and sidewalk, shared driveways for some lots
    - . Zero discharge of stormwater—one third of roof runoff stored in infiltration tank, rain garden in front yard natural area
    - . Use of native and climate "friendly" plants

- Natural vegetation retained as rear yard buffer
- Significant community open space and buffers
- Uncurbed roads and narrow (50') rights-of-way
- Restriction to protect hardwood tree canopy and understory vegetation
- Proximity to U. of Florida and trail connections
- All homes EnergyStar, WaterStar, and resource efficient

- The following construction cost comparisons by the developer of the Madera Subdivision show an overall cost savings due to LID design:

MADERA CONSTRUCTION COSTS ('03 – '04) PER LOT

Task	LID Cost	Conventional Cost	LID Savings
Clearing/Grading	$1612	$2016	$400
Utility connections	Same	Same	0
Mulch	910	496	-414
Landscaping	6485	6485	0
Turf	720	2331	1611
Irrigation	1275	1500	225
Shared driveway	6084	7584	Varies with material
Infiltration tank	1032	0	-1032
Turf reinforcing for parking	845	0	-845
Regional stormwater pond			1000
TOTAL per lot	$18,963+pond	$20,412+pond	$945

- The following annual maintenance cost comparisons by the developer of the Madera Subdivision show an overall cost savings due to LID design:

MADERA ANNUAL MAINTENANCE COSTS ('03 – '04) PER LOT

Task	LID Cost	Conventional Cost	LID Savings
Mowing and landscaping services	$1470	$3150	$1650
Professional pesticide application	$200 (integrated pest management)	$300	$200
Irrigation	$72 (32,000 gal)	$168 (74,000 gal)	$96 (42,000 gal)
TOTAL per lot	$1742	$3618	$1876

There is evidence from parts of the country where the methods have already been employed that low impact development practices are welcome and successful, although there is apprehension among the local building associations as to the costs and benefits of implementing LID practices. Nevertheless, there is evidence that incorporating on-site LID practices saves costs for builders, at least in some parts of the country. Further, the National Association of Home Builders endorses the LID concept and has created a supportive web site for builders.

C. Jurisdictional Survey

A written survey was prepared and sent to a number of jurisdictions known to have LID standards in place. Mecklenburg County, NC, and Portland, OR, responded. Mecklenburg County reported that its LID standards

were developed with help from the Low Impact Development Center in Maryland. The standards were incorporated into the county's zoning ordinances for residential, commercial, industrial, and municipal new development and redevelopment projects and tailored for specific parts of the community. Portland's standards were codified through a new city ordinance and apply to new development of residential, commercial, industrial, and municipal projects. LID standards apply to "newly redeveloping" projects in Portland only for the portion being redeveloped. Both agencies created their LID standards in response to existing or foreseen water quality requirements of their stormwater permits. The complete survey responses can be found in Appendix A.

IV. SUMMARY AND CONCLUSION

Summary

While LID commonly refers to the construction of buildings and its surrounding landscape, there are also opportunities to include LID-type post-construction BMPs in County capital road projects. For example, Public Works' project design policy could be modified to include, where appropriate, any combination of vegetated drainage swales, grassed buffer strips, bioretention parkways, pervious parking lanes, or inverted medians. The vegetated BMPs could have the added benefit of improving the streetscape. Public Works' Highway Manual and Project Preparation Manual could be modified accordingly to include these practices where appropriate. Manuals could be modified to include, where appropriate, vegetated buffers, low flow swales, bioretention, and similar practices upstream of catch basin inlets.

The following are advantages to adopting LID standards for unincorporated areas of Los Angeles County:

- Preservation of natural assets: soils, native vegetation, wildlife habitat, natural landscapes are preserved.
- Better space utilization in new development: the elimination of dedicated parcels for stormwater basins can potentially maximize lot yields for the developer.
- Enhanced aesthetics: natural lots, buffers, the absence of unsightly stormwater basins can provide higher unit pricing.
- Improved public health and safety: less open-water than for regional BMPs, fewer vectors and mosquitoes, fewer bacteria from water fowl mean less liability.
- Reduced operating and maintenance costs: less infrastructure, smaller infrastructure footprint, owners' participation means less public sector maintenance.
- Better reliability: distributed systems provide redundancy, problems are noticed sooner.
- "Green" image: LEED certification, marketing edge, visibility in environmental stewardship are all benefits.
- Public involvement: consciousness among users, LID maintenance skills, pollution prevention, quicker reporting of problems can occur.
- Lower public maintenance costs: maintenance costs are scaled down and are distributed among property owners.

The following may be challenges to adopting LID standards for unincorporated areas of Los Angeles County:

- New approaches will require new regulations, such as site planning and building clustering.
- New ordinances must allow LID.
- Private and public sector designers must change their design standards.
- Project reviewers must have procedures in place and be trained in LID methodology.
- Property owners must buy into stormwater management to a degree that they are willing to maintain LID devices on their own property.
- More research on LID performance must be accomplished.
- Models must be developed to optimize the size, location, and function of LID practices.

CONCLUSION

The recommendations described herein for the incorporation of Low Impact Development standards will help the County realize its goals to conserve water, and clean stormwater and urban runoff. The recommendations respond to the January 16, 2007 Board Motion by offering a proposed program that will: incorporate low impact development standards into new development, redevelopment, storm drain, and road projects; develop an implementation program that will eliminate barriers to incorporating low impact development standards; educate staff; and educate the public.

Question	Mecklenburg County, NC	Portland, OR
Is your LID program now part of a stormwater permit program (either MS4 or CSO)?	Yes, as part of the MS4 Phase 2 Post Construction requirements.	Both – we implemented our regulatory LID program in 1999 with citywide regulation (MS4, CSO and IUC drainage areas). Our voluntary programs mostly target CSO but do have MS4 and UIC program area activities as well.
Was it originally mandated by an MS4 or CSO permit?	---	Our original post-development controls effort was in response to the MS4 permit regulations.
Was it created separately in anticipation of MS4 or CSO permit regulations?	---	No – as part of the compliance package. We started before receiving our permit, but actually implement after our permit.
Is it an ordinance (e.g. LID ordinance), a resolution, a mandate, or has it been incorporated into the Municipal Code, etc.?	Zoning ordinance	The regulations were developed by a public committee, passed through a City ordinance passed by the City Council and resulted in a new code section of the City Code (17.38)
What types of projects does it apply to, e.g. residential, commercial, industrial, municipal?	All	All. Some offsite fees allowed for sites unable to meet requirements for onsite controls.
What are the different requirements for each of these types of developments?	Different standards in core of community where we want intensity and more restrictive in east/west side of core where we want lower intensity	We don't really distinguish for the post development acreage facilities. There are a number of commercial activities - such as fueling islands, wash bays, etc – that have additional regulations for segregating flows and having a sanitary sewer connection.
How is redevelopment within already developed areas handled?	Any additions over 5000 SF are required to implement LID practices.	Those sites only are required to build facilities for the "newly redeveloping" areas. For instance a 5,000 sq foot building is added to a 40,000 sq foot one. The LID facility is only required to manage the 5,000 sq feet, but we strongly encourage upsizing facilities to manage the existing development as well.
Who created your LID program?	Mecklenburg County	Internal engineering and policy group staff working for a public policy committee. Some consultant assistance was used to develop various site design examples for various standards.
Did you utilize an outside consultant or did you primarily rely on staff research to design the program your jurisdiction would utilize?	We had help from the LID Center in Maryland, Larry Coffman and Neil Weinstein.	Mostly internal staff. External consultants were used to evaluate and offer alternatives to internally created design storm sizes.
If you are using other's guidelines, who adapted them, you or an outside consultant?	Mecklenburg County Water Quality Program adapted them.	Internal engineering staff
If you based your program on another agency's guidelines, what process did you go through to transform the guidelines to your city's own requirements?	Modifications were necessary due to clayey soils and different rainfall intensities.	We ran a full SWMM model for each design storm (1/2 2, 2, 5, 10, 25, and two times 10)

Question	Mecklenburg County, NC	Portland, OR
Did you already have a post-construction BMP program in place?	Yes, it was in place on July 1, 2007.	No
If so, how was the transition to an LID program accomplished?	It was readily adopted because Huntersville watershed drains into Mountain Island Lake from which the City of Charlotte obtains its drinking water.	We started with a full LID, but included more semi-regional facilities such as big ponds and wetlands.
Are your guidelines voluntary or mandatory	Mandatory.	We have regulation for any added impervious area of 500 sq feet, and incentives to retrofit existing development.
How do you plan to keep up with changing technology and/or public policy?	We continually attend LID workshops, conferences, read magazines, and do research on the web.	We update the regulatory manual every 3 years. Also have a standing external stormwater review committee.
What hydrology method do you use (e.g. Rational Method, HSPF, SWMM, TR-55/TR-20, HEC-1, etc.)?	TR-55, HEC-1 (Hydrology Software such as hydrocad, hydroflow, Pond Pack, etc.)	We have used a variety – mostly SWMM, but also allow use of Santa Barbara (our minimum standard), rational for large basins, and Hec
Was this method used in the past or was it newly adopted?	Same method.	SWMM
Was the method already familiar to the local building industry or did it have to be introduced?	They had been using it.	We had to allow for the rational and Santa Barbara method to make it easy on developers.
Is the reduction of post-development sediment loading to streams an issue for you?	Yes. 85% TSS removal is mandatory.	Yes – our full standard is a TSS standard.
How do you determine compliance with LID standards?	Through a thorough review process and field inspection during construction.	Plan review, construction inspection, and post development maintenance inspection program.
Do you or an outside contractor check for compliance?	The County reviews the plans.	No
Do you have a different process for public capital projects vs. private projects?	No.	Yes – CIP managers do their own Public Works jobs.
How long did it take to establish and enact your LID program?	About 6-9 months	5 years
Would you consider the program a “work-in-progress”?	Yes, always learning	No – it is pretty comprehensive, and recent work is tweaking with the format and implementation pieces.
Is there an outside LID consultant or consultants you and/or your applicants regularly work with on a project-by-project basis?	---	Yes – a few big ones here – CH2M Hill, David Evans and Associates, URS, Parametrix, etc
Have you conducted a performance review of the LID program? For example, have you measured and compared pre- and post-development pollutants, runoff rates and volumes?	The County monitors certain BMPs and has installed many of their own which they monitor for design data.	Yes – we use that data for evaluating our benchmarks for the MS4 permit.
Has there been a quantified cost to your jurisdiction associated with implementing your LID program?	---	Not specifically – part of the overall cost

Question	Mecklenburg County, NC	Portland, OR
Have you found that the implementation of an LID program requires collaboration between different agencies within your jurisdiction, such as Public Works and Planning Department?	Yes; public works will eventually maintain lid areas in the future.	Yes – also our building bureau and transportation bureaus are big players. We have reviewed various zoning and building codes for barriers to LID (such as paving drainage terraces). Also want to educate various program CIP designers, and there may be case by case needs where an LID facility may need access or encroachment into City ROW.
Have you found it necessary to provide extensive staff training to implement your LID program?	Cursory training for planning staff, but the County has put on several day-long workshops for developers, engineers, architects. The plan reviewers receive hands-on training from members of the water quality program.	Yes – and need to do more. Usually we link training to revisions of the regulatory manual – once every three years. Amount of training varies depending on staff role in development review and inspection.
Do you have a section or division dedicated solely to LID guidelines and compliance?	The County Water Quality Program updates the design manual as needed, annually at the beginning.	Now yes – just got the first dedicated group this year after working on LID since 94.
How has your LID program been received by the private sector?	Initially skeptical, but there has been no discernable downturn in development.	Positively – we try to make easy to understand regs and concentrate on providing easy to use tools – especially sizing criteria for individual LID facilities.
How has your LID program been received by your staff?	Well received	Mostly positive – some question the value of onsite LID versus regional public facilities.
Does your jurisdiction provide incentives for LID implementation, such as priority plan check or reduced processing fees, expedited permits, grants/loans, financial incentives, technical assistance?	Mandated; no special incentives, except as allowed in ordinance for reduced setbacks, sidewalks on 1 side of street, fewer and smaller required trees and shrubs, and encroachments into buffers.	Yes – monthly fee discounts (at least for the next 9 years), free TA, and some community stewardship grants for voluntary retrofits.
Have you provided training for the developers, engineers, architects, landscape architects, contractors, and maintenance personnel in your area?	Yes, see comment above.	Yes – especially the first few years our regulatory manual was out (1999-2002)
Are there policies in your General Plan that support LID implementation and retrofitting?	No	Not sure what you mean by “General Plan”. We have Policies in our required land use plans (Comprehensive plan and Facilities plan), plus also in our Stormwater MS4 Permit Management Plan.
Have you incorporated LID development standards into your Zoning Code?	Yes	Yes – in the land division and landscaping sections in particular.
Have you amended the Subdivisions Code to address such issues as landscaping, infiltration, on-site rainfall storage, plumbing, etc.?	Yes	Yes – constantly updating.

Question	Mecklenburg County, NC	Portland, OR
What are some challenges you have encountered, either in implementation or with the public?	Most difficult has been training engineers to think about minimal disturbance of the site. LID is a verb, not a noun. It is a design philosophy which tries to have a design conform to the site, not have the site conform to the design. The key is the planning of the site, determining the critical areas to avoid such as steep slopes, wetlands, mature vegetation, poor soils, stream corridors and stream buffers, Once these areas have been delineated, the remainder is "buildable". First comes low impact design, which results in a low impact development	Yes – issues of space – we are moving to dense urban development forms with minimal space for LID. Most of public on board now.
Did you outreach to any interest groups before you developed the program?	---	Yes – AGC and Home Builders and Local Engineering firms in particular.
Any advice for jurisdictions just getting started with developing LID programs?	Contact municipalities that have implemented it and have them present at the public meetings to answer the tough questions.	Use a public committee to advocate for you in front of your council or commission. Also don't rush your effort – assume at least 2-3 years. Make sure you have sufficient staff time and/or consultant funds to run models and examples of design scenarios – complete with cost information.

APPENDIX D, Resources

CH2M Hill, Seminar: Low Impact Development Principles and Implementation—A Hands-on Approach, June 15, 2007.

City of Calabasas, Planning and Environmental Programs Division, web site. http://www.cityofcalabasas.com/departments/planning-division.html

City of Chicago, IL, Department of Planning and Development, web site. http://www.cityofchicago.org/city/webportal/portalDeptCategoryAction.do?BV_SessionID=@@@@1623832183.1176226959@@@@&BV_EngineID=cccdaddkikljfdkcefecelldffhdfhg.0&deptCategoryOID=536890773&contentType=COC_EDITORIAL&topChannelName=Dept&entityName=Planning+And+Development&deptMainCategoryOID=-536884767

Coffman, Larry, Seminar: LID Overview, June 21, 2007.

Coffman, Larry S. Westchester Environment, *Low Impact Development*, Jan-Feb 2003.

Letter from Jonathon Bishop, Executive Officer, Los Angeles Regional Water Quality Control Board, to Mark Pestrella, County Public Works, December 15, 2006.

Letter to Xavier Swamikannu, Los Angeles Regional Water Quality Control Board, from Construction Industry Coalition on Water Quality, March 7, 2007.

Low Impact Development web site, http://www.lid-stormwater.net/, accessed July 8, 2007.

Low Impact Development web site, http://www.lid-stormwater.net/intro/background.htm, accessed July 8, 2007.

National Association of Home Builders' ToolBase Services web site, http://toolbase.org/Technology-Inventory/Sitework/low-impact-development, accessed August 1, 2007.

Regional Water Management Group. June 2007. *Antelope Valley Integrated Regional Water Management Plan, Draft Report.* http://avwaterplan.org/index.cfm?fuseaction=draftplan.

Portland, Oregon, Green Street Program, web site. http://www.portlandonline.com/bes/index.cfm?c=44407&, accessed August 15, 2007.

Prince George's County, MD, Department of Environmental Resources, Programs and Planning Division, *Low-Impact Development Design Strategies: An Integrated Design Approach*, June 1999.

City of Santa Monica, Environmental Programs Division, web site. http://greenbuildings.santa-monica.org/index.html

City of Seattle, WA Natural Drainage Systems Program, web site. http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Natural_Drainage_Overview/index.asp

U.S. EPA, "Maryland Developer Grows 'Rain Gardens' to Control Residential Runoff," Nonpoint Source News-Notes, August/September 1995 Issue #42.

U.S. EPA Office of Wetlands, Oceans and Watersheds web site, http://www.epa.gov/owow/nps/lid/, accessed August 1, 2007.